

CAMINO-101 → **[Class B AIS]** ←

User's Manual





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WARNING!

FOR USERS IN THE UNITED STATES OF AMERICA ONLY

WARNING: It is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user, or to otherwise input any inaccurate data in this device.

- ★ The entry of static data into this device shall be performed by the vendor of the device or by an appropriately qualified person in the business of installing marine communications equipment on board vessels.
- ★ Instructions on how to accurately enter and confirm static data in the device can be found in Section 3.3 of this user manual.

The equipment said in this manual must only be used to which it was designed. Improper operation or installation may cause damage to the equipment or injury to personnel. AMEC will not incur any liability of equipment damage or personal injury due to improper use or installation of the equipment. It is strongly recommended to read this manual and the following safety instructions before proceeding to installation or operation.

SAFETY INSTRUCTIONS

WARNING



ELECTRICAL SHOCK HAZARD.

Do not open the case of the equipment. Only qualified personnel could work on the interior of the equipment.

TURN OFF THE POWER IMMEDIATELY IF WATER LEAKS INTO THE EQUIPMENT OR OBJECT DROPS INTO THE EQUIPMENT.

Continue operating the equipment could cause electrical shock or fire. Contact your nearest distributor for service.

DO NOT DISASSEMBLE OR MODIFY THE EQUIPMENT.

Improper disassemble or modification could cause electrical shocks, fire, or personal injury.

AVOID OPERATING THE EQUIPMENT WITH WET HANDS.

Electrical shocks could be resulted if operating with wet hands.

WARNING

TURN OFF THE POWER IMMEDIATELY IF THE EQUIPMENT IS EMMITTING SMOKE OR FIRE.

Continue operating the equipment could cause electrical shock or fire. Contact your nearest distributor for service.

EVENTHOUGH THE EQUIPMENT IS WATERPROOF, PLEASE AVOID DIRECT CONTACT WITH RAIN OR SPLASHING WATER.

Electrical shock or fire could be resulted if water leaks into the equipment.



FOREWORD

Congratulations on the purchase of your new CAMINO-101 Automatic Identification System (hereinafter called "AIS"). Wherever you sail now, you can have a better control of your surrounding sea, and have an enjoyable voyage.

Camino-101 AIS is strictly tested to meet the rigorous demands of the marine environment. Unless improper use, installation, or maintenance, the equipment should function properly at its optimum.

We thank you for choosing our product and we wish you bon voyage!



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1 INTRODUCTION

1.1 CAMINO-101 Overview

The CAMINO-101 is a Class B AIS transponder using carrier-sense TDMA (CSTDMA) technology. It is designed to be inter-operable and compatible with Class A or other Class B ship-borne AIS stations or any other AIS stations operating on the AIS VHF data link.



CAMINO-101 AIS uses marine VHF channels with frequency set universally from 156.025 MHz to 162.025 MHz. Having CAMINO-101 AIS on board, not only can you monitor the status of the vessels in the surrounding area, but also receive the dynamic information (position, speed, SOG, and etc.), static information (ship name, MMSI, call sign, and etc.), and voyage related information (cargo type, destination, and etc.) from any vessels equipped with AIS. An external computer installed with AMEC AIS Viewer software or an AIS-ready plotter device is required in order to view the AIS information above mentioned.

CAMINO-101 AIS is one of the cutting-edge navigational aid equipments allowing real-time information exchanges within the AIS network. It is also capable of integrating with other maritime systems such as Electronic Chart System (hereinafter called “ECS”) for various maritime navigation applications.

CAMINO-101 is designed with 2 RF receivers and 1 RF transmitter. One of the RF receivers is time-shared between AIS and DSC. On the front panel, CAMINO-101 is equipped with 3 LED indicators. At rear panel, there are 1 VHF antenna connector, 1 GPS antenna connector, 1 optional Bluetooth connector and antenna (CAMINO-101W only), 1 NMEA interface connector, 1 RS232 interface connector (CAMINO-101A/W supports Tx-Off Switch Box via this connector), 1 power connector, and 1 power switch.

NOTE: The CAMINO-101 is an equipment to be used in protected environmental conditions. It is not intended to expose to rain or spray longer than a minute.

1.2 Type of AIS

There are mainly two types of AIS transponder: Class A and Class B. The intended nature of these AIS systems in navigations is different as illustrated in the following table. CAMINO-101 is a Class B AIS transponder.

Table 1-2 Type of AIS

Class A AIS	• Transmits and receives AIS signal in SOTDMA protocols. • Intended for vessels meeting the IMO AIS carriage requirements. • It is mandatory for all commercial vessels that exceed 300 tons to be equipped with Class A AIS.
Class B AIS	• Transmits and receives AIS signals in CSTDMA protocols. • Not necessarily in accord with IMO AIS carriage requirements. • It is not mandatory for vessels to be equipped with Class B AIS. • Suitable for recreational vessels or fishing boats, in enhancing its safety at sea.

1.3 AIS Message Type

The CAMINO-101 transmits following message types.

Table 1-3 CAMINO-101 AIS message type

Type of Message	Data Details
Static Data	Maritime Mobile Service Identity number ("MMSI") Call sign and name Type of ship Length and beam GPS Antenna location
Dynamic Data	Position of the vessel Course Over Ground (hereinafter called "COG") Speed Over Ground (hereinafter called "SOG") Heading
Dynamic Reports	Speed of the ship Status of the ship
SRM	Alarm Safety



1.4 AIS Report Rate

The CAMINO-101 supports following report rates in accordance to ITU-R M.1371 and IEC 62287-1.

Table 1-4 CAMINO-101 AIS report rate

Platforms Condition	Nominal Reporting Interval
Class B Ship-borne mobile equipment not moving faster than 2 knots	3 Minutes
Class B Ship-borne mobile equipment moving faster than 2 knots	30 Seconds
Report rate by command of VTS	5 Seconds highest

1.5 About this Manual

The manual contains installation instructions and operating information for CAMINO-101. While most of the installation can be performed by the owner or the crew, a final commissioning can be done by your local agent/dealer when needed or required. AMEC and the local agent/dealer will not bear any responsibilities over any damages resulted in improper installation by unauthorized agent/dealer.

1.6 Important Notice

The intended use of the AMEC CAMINO-101 AIS is to enhance the safety of vessels at sea. However, a few points must be noted as below,

- Any AIS cannot guarantee monitoring and receiving signals from all vessels in the surroundings unless those vessels are equipped with AIS devices.
- It is important to note that the AIS is designed for the purpose of anti-collision and serves as a compliment to navigation. It is not the absolute navigational equipment and does not replace any navigational system installed on board.
- Although AIS operates automatically by itself, the owner or the crew on the vessel should still maintain a proper lookout for the surroundings. While AIS is capable of setting alarms for Distance to Closest Point of Approach (hereinafter called “CPA”) and Time to the Closest Point of Approach (hereinafter called “TCPA”), vessel owner or the crew should be aware of the fact that there are vessels not equipped with AIS, and this function will not apply with these vessels.
- Incorrect data and information entered into the AIS is considered as erroneous information. Erroneous information or improper configuration will cause risk to both own vessel and

surrounding vessels when these information are transmitted. Users must be aware of this risk and ensure that all information entered into the system is correct and up-to-date.

2 INSTALLATION

2.1 General

2.1.1 Safety Instructions

Before proceeding with installation, take note of the following safety instructions and read through this installation manual carefully.

SAFETY INSTRUCTIONS

WARNING	
 ELECTRICAL SHOCK HAZARD Do not open the case of the equipment. Only qualified personnel could work on the interior of the equipment.	FOLLOW THIS INSTRUCTION MANUAL TO PROCEED WITH THE INSTALLATION. AMEC and your local agent/dealer will not bear any responsibility of equipment damage or personnel injury due to improper installation.
TURN OFF THE POWER BEFORE PROCEEDING WITH INSTALLATION. Proceeding with installation with the power on could cause electrical shock or fire.	
AVOID INSTALLING THE EQUIPMENT WHERE THERE IS DIRECT CONTACT WITH RAIN OR SPLASHING WATER. Electrical shock or fire could be resulted if water leaks into the equipment.	
MAKE SURE THE POWER SOURCE AND THE POWER INPUT OF THE EQUIPMENT ARE COMPATIBLE. Damage to the equipment and fire could be resulted if the power sources are not correct. Please check the correct power input on the adaptor.	

WARNING	
Warning Label A warning label (Figure 2-1-1) is attached underneath the equipment. Warranty of the equipment will be invalid if this label is detached or broken. AMEC and your local agent/dealer will not bear any responsibility of any damage to the equipment, or damage in related to the equipment, personnel injury, and etc. Reject the equipment if this label is detached or broken. Please contact your local agent/dealer if this label is missing.	

Warning  注意	Name: Warning Label No Warranty if this label is detached or broken. 保固撕毀无效
---	---

Figure 2-1-1 Warning label

2.1.3 Items in the Package

Please verify items in the package. If any is missing, please contact your local AMEC representative. The CAMINO-101 is typically delivered with standard package as shown in Table 2-1-3-1. It is also illustrated in Figure 2-1-3 (except Viewer CD and manual). Table 2-1-3-2 also shows optional accessories available from AMEC.

Table 2-1-3 Standard equipment list

No.	Description		Qty
1	CAMINO-101 Class B AIS main unit		1
2	Manual		1
3	Installation Kit	Power Cable, 1.5m, AWG 18	1
		NMEA 0183 interface cable, 1.5m	1
		RS-232 interface cable, 1.2m	1
		M6×20 Screws	4
4	Software CD: AMEC AIS Configuration & AMEC AIS Viewer		1

NOTE:

(1) AMEC would not be able to fully ensure overall product performance if longer cable length other than the above specified length is used.

(2) If an extension power cable is required, use large gauge cable to minimize voltage drops.

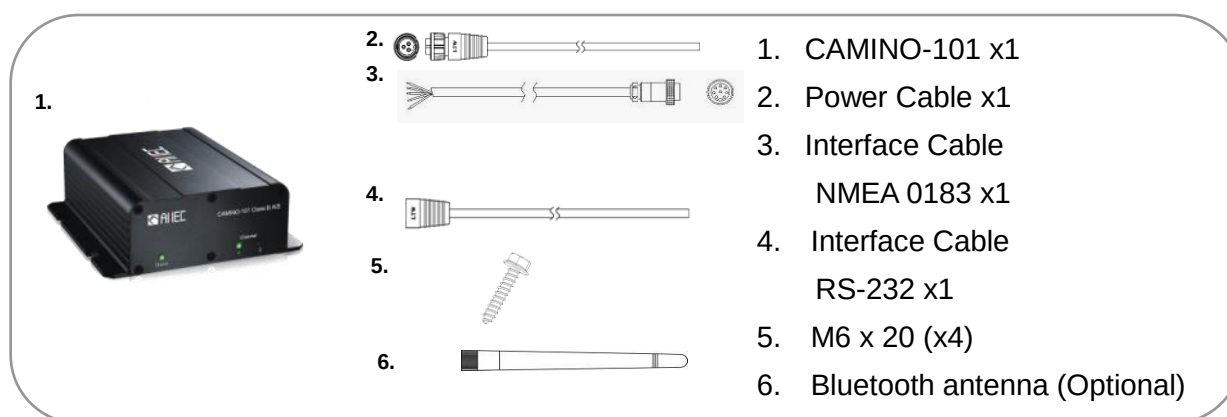


Figure 2-1-3 Package items

2.1.3.1 Optional Supply

Table 2-1-3-1 Optional equipment list

No.	Description	Remarks
1	VHF Antenna	--
2	GPS Antenna	10m cable included
3	VHF Antenna Cable	10m

NOTE: AMEC would not be able to fully ensure overall product performance if longer cable length other than the above specified length is used.

2.2 Installation Procedure

2.2.1 Installation Precautions

① Installation should proceed in a safe environment and does not have direct contact with rain or splashing water.

② If it is required to use a ladder to install the equipment, take extra caution and be careful of falling down.

③ Do not place or install the equipment beneath or near any container that filled with water or liquid.

④ Do not place or install the equipment where it is easily tripped, stepped on, or kicked at.

⑤ Do not place or install the equipment near any generator or engine.

⑥ When installation is completed, please remember to key in own ship's MMSI data and related information through AMEC AIS Configuration software. Please refer to Section 3.3.

2.2.2 Step by Step Installation Instructions

AMEC CAMINO-101 can be installed and mounted on flat surface, or it can be mounted on wall as shown below.

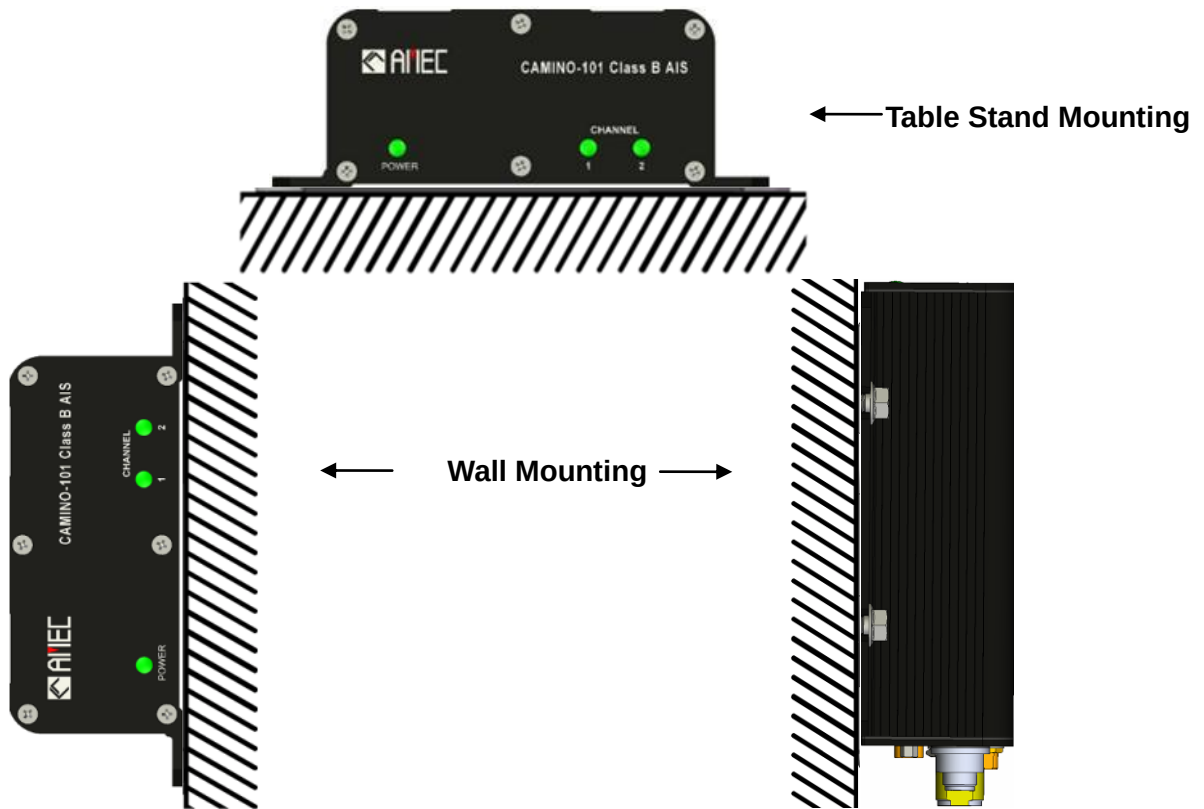
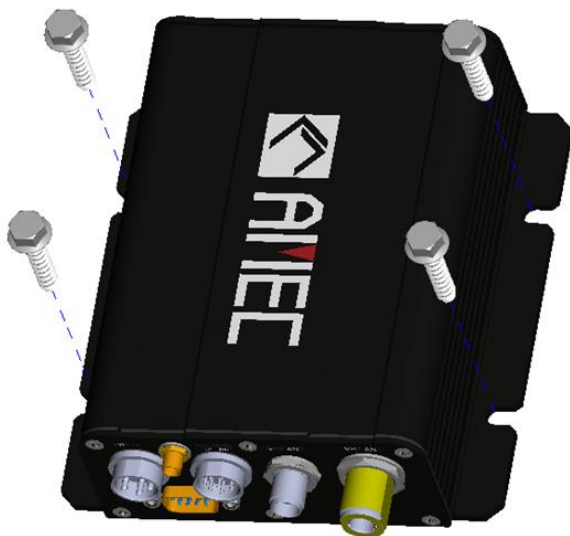


Figure 2-2-2-1 Installation overview

I. Installation Instructions



Step 1:

Place CAMINO-101 on the desired spot for installing.
(Refer to figure 2-2-2-2)

Step 2:

Use the supplied M6 × 20 screws from the accessories to mount.
(Refer to figure 2-2-2-2)

Figure 2-2-2-2 Installation instruction

II. Cabling Instructions

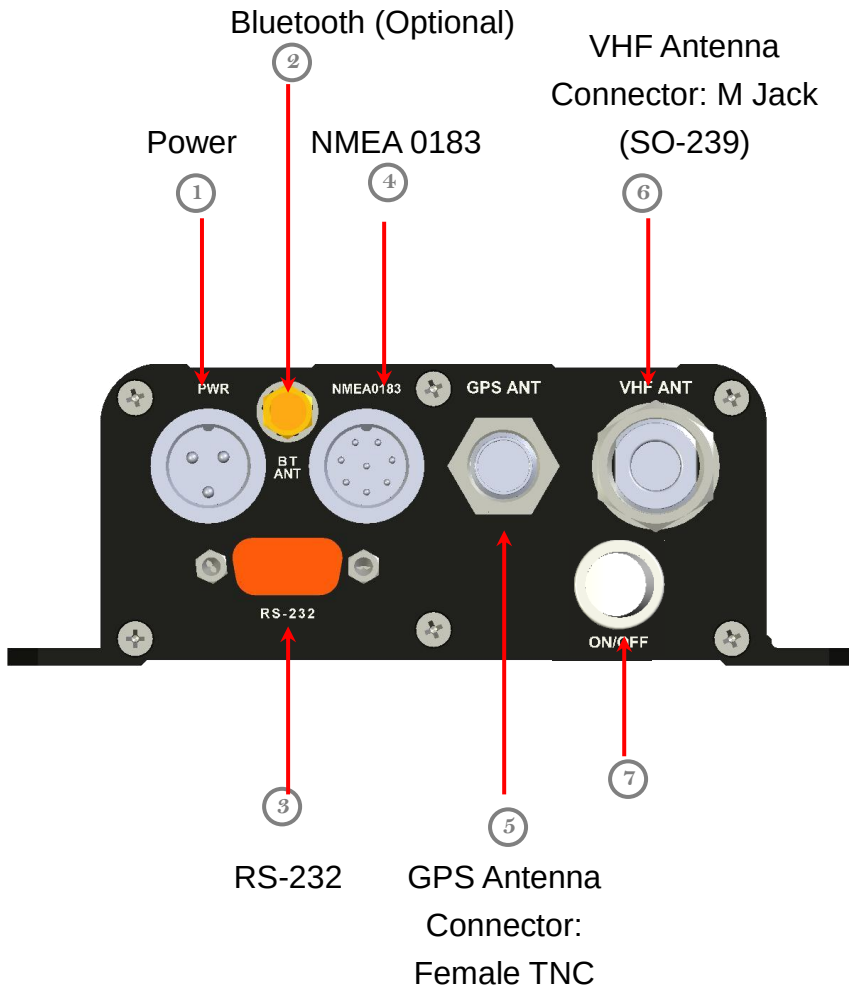


Figure 2-2-2-3 Cabling instructions

Step 1:

Connect the GPS cable to the GPS ANT **5** *.

Step 2:

Connect the VHF cable to the VHF ANT **6**.

Step 3:

Connect NMEA 0183 compatible system to the NMEA interface **4**.

Step 4:

Connect either RS-232 or Bluetooth antenna to your computer if needed.

*** DO NOT CONNECT THE TWO INTERFACES SIMULTANEOUSLY.**

Step 5:

Pairing Bluetooth to your computer if needed. (Please refer to 2-2-2-3).

Step 6:

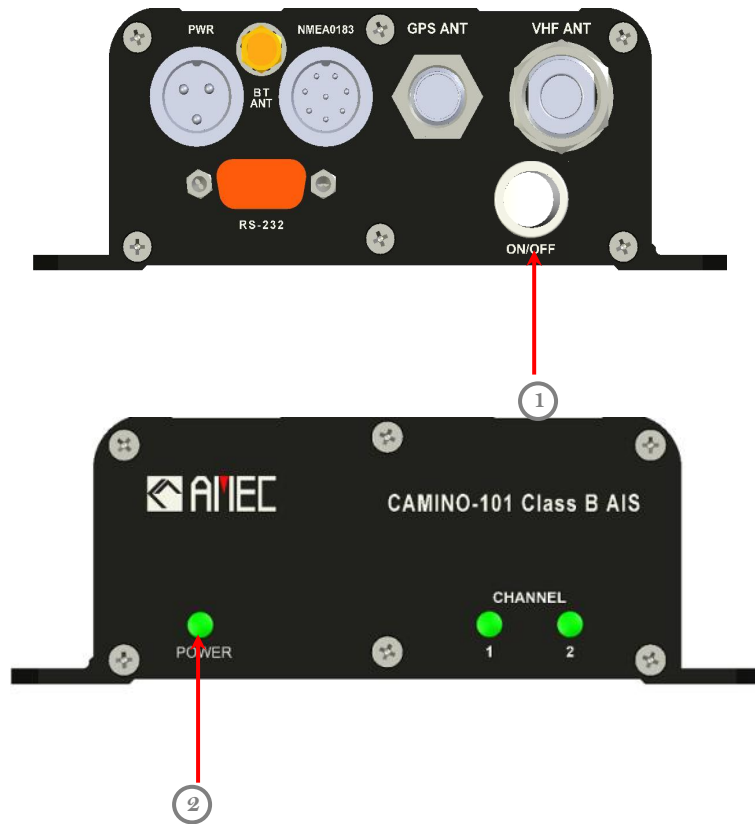
Connect the Power cable to the PWR **1**.

Step 7:

Open the CAMINO-101 by switching **7** to "ON"

***NOTE: CAMINO-101 SUPPLIES ONLY 3.3V FOR GPS ANTENNA. WE RECOMMEND USING AMEC GPS ANTENNA (3.3V) WITH CAMINO-101. IF A 5V GPS ANTENNA IS CONNECTED TO CAMINO-101, IT MAY CAUSE DETERIORATION TO GPS RECEIVING PERFORMANCE.**

III. Start-Up Setting



Step 1:

Connect the power cable to the power input and turn on CAMINO-101 by switching to "ON". ①

Step 2:

Check if the POWER indicator ② is working properly.

Please refer to Section 3.1

Figure 2-2-3-4 Installation instruction

Note: The required power voltage for CAMINO-101 is 12V / 24V DC. Use an adaptor if the supply voltage is not within the range.

2.2.3 Connector Pin Definition and Cable Wiring

2.2.3.1 Power Connector: Pin Definition and Cable Wiring

The power cable supplied has only a round connector at one end and there are two inner (red & black) wires. The wiring details are defined as follows:

Table 2-2-3-1 Power connector pin definition

Pin	Wire Color	Name	Function
1	-	-	-
2	Black	GND	Power Ground
3	Red	PWR	Positive (+); the input should be 12V / 24V DC

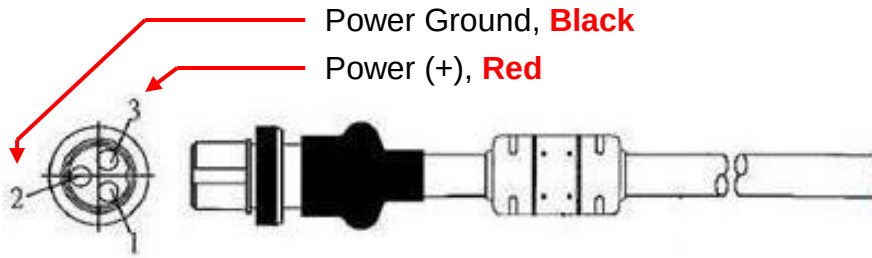


Figure 2-2-3-1 Wiring definition in Power Cable

2.2.3.2 NMEA 0183 Connector: Pin Definition and Cable Wiring

The NMEA 0183 cable supplied has only a round connector at one end and there are six inner wires. The wiring details of the NMEA cable are listed below.

Table 2-2-3-2 NMEA 0183 pin definition

Pin	Wire color	Name	Function
1	Brown	RXP	Positive(+); NMEA0183 Data input
2	Blue	RXN	Negative (-); NMEA0183 Data input
3	White	TXP	Positive(+); NMEA0183 Data output
4	Green	TXN	Negative (-); NMEA0183 Data output
5	/	/	/
6	Red	/	Reserved
7	Purple	/	Reserved
8	/	/	/

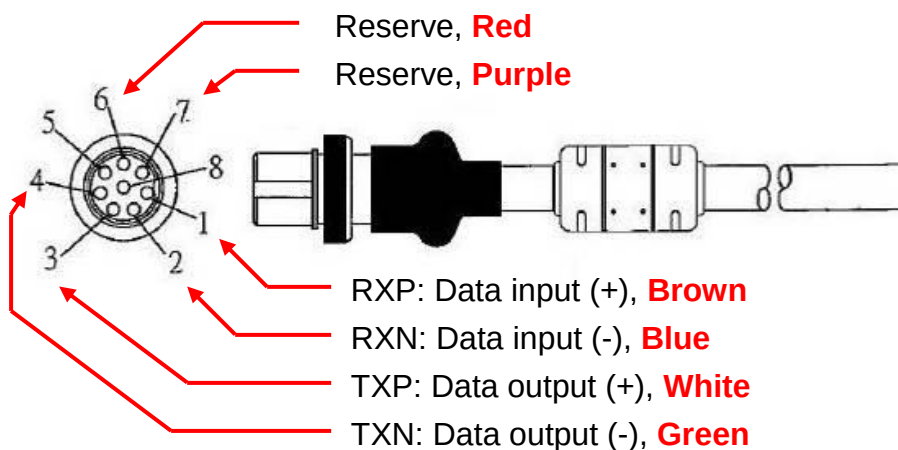


Figure 2-2-3-2 Wiring definition in NMEA 0183 cable

NMEA 0183 Connection Illustration

Refer to the illustration below when connecting to an external NMEA device via the onboard NMEA 0183 interface.

CAMINO-101 NMEA 0183

External NMEA device

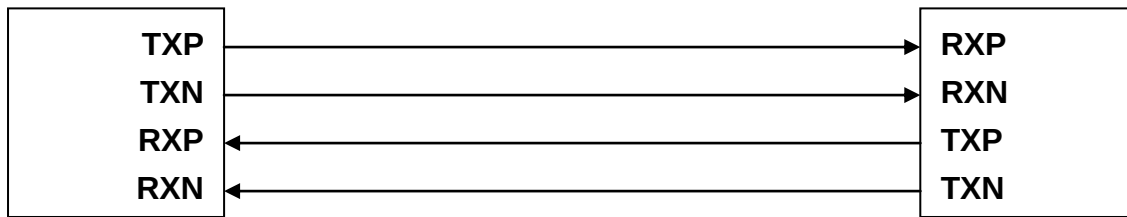


Figure 2-2-3-1 NMEA 0183 connection illustration

- NOTE:**
1. Please make sure the external device is fully NMEA 0183 compliant.
 2. The CAMINO-101 NMEA interface supports the following input sentences: RMC, GGA, GBS, GSA, and HDT.
 3. If user wants to use additional external GPS source the following points shall be assured: (i) the external position source is using WGS-84 datum; (ii) the accuracy of the external GPS source should be shorter than 10 m in LAT or LON; (iii) the external position is within 26 m of the internal position.

2.2.3.3 RS-232 Connector: Pin Definition and Cable Wiring (CAMINO-101)

The RS-232 connector pins on CAMINO-101's rear panel are defined as follows:

Table 2-2-3-3 RS-232 connector pin definition

NO.	NAME	FUNCTION
1	/	/
2	RX	Receive Data
3	TX	Transmit Data
4	/	/
5	GND	Ground
6	/	/
7	/	/
8	/	/
9	/	/

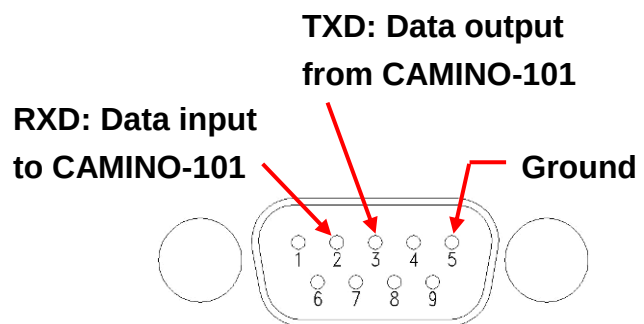
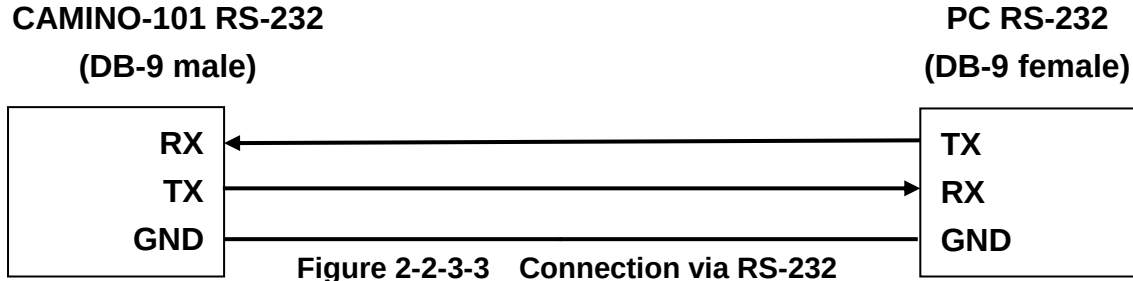


Figure 2-2-3-3
RS-232 Pin definitions, CAMINO-101

RS-232 Connection Illustration (CAMINO-101)

The RS-232 cable supplied with CAMINO-101 contains 9 different wires. However, only 3 wires are being used. This cable is a cross-over connection, not a straight thru connection. Refer to the following illustration when connecting to an external RS-232 device.



2.2.3.4 RS-232 Connector: Pin Definition and Cable Wiring (CAMINO-101A & CAMINO-101W)

CAMINO-101A and CAMINO-101W models' RS-232 connector pin assignments are different than on CAMINO-101 model's.

On CAMINO-101A and CAMINO-101W, there are additional pin assignments at the RS-232 connector specifically for connecting to an optional external Tx-off Switch Box. See also Tx-Off Switch Box User Guide.

Table 2-2-3-4 RS-232 connector pin definitions

NO.	NAME	FUNCTION
1	/	/
2	RX	Receive Data
3	TX	Transmit Data
4	GND	I/O Ground
5	GND	RS-232 Ground
6	/	Tx-Off
7	/	Tx-Off LED
8	GND	RS-232 Ground
9	GND	I/O Ground

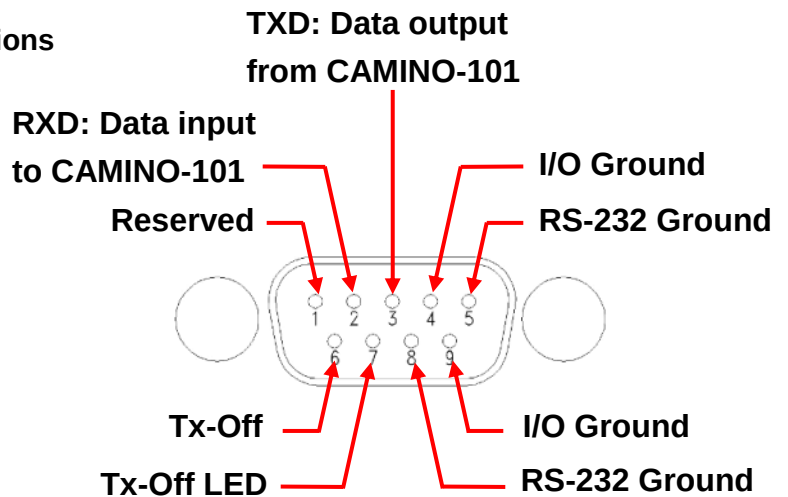
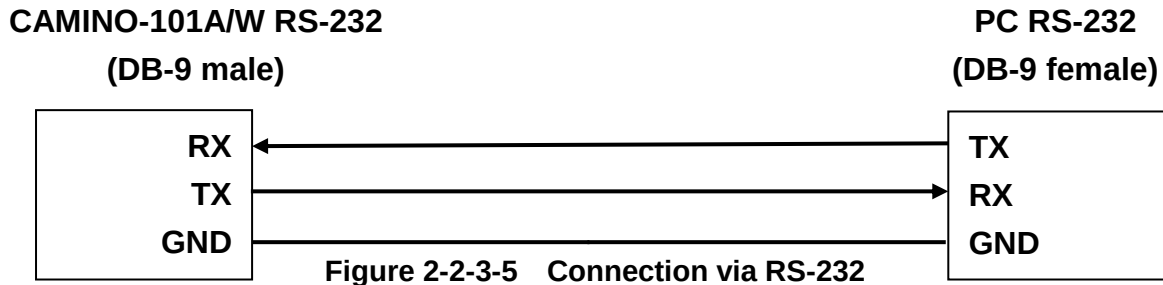


Figure 2-2-3-4
RS-232 Pin definitions, CAMINO-101A / W

RS-232 Connection Illustration (CAMINO-101A & CAMINO-101W)

The RS-232 cable supplied with CAMINO-101A & CAMINO-101W consists of 3 wires dedicated for RS-232 connection. (Please note: the 9-wires-RS232-cable used in CAMINO-101 cannot be used for these two CAMINO-101A/W models.) This connection is cross-over and not straight thru. Refer to the following illustration when connecting to an external RS-232 device.



2.2.4 VHF Antenna Installation

The quality and positioning of the antenna are the most important factors dictating AIS performance. It is recommended that a VHF antenna with omni directional vertical polarization be specifically tuned for AIS operation band. Since the range of VHF signals is largely decided by line of sight distance, the VHF antenna should be placed as high as possible and at least 5 meters away from any constructions made of conductive materials. It is recommended to keep the VHF antenna at least 3 meters away from the CAMINO-101 unit.

To avoid interference, the VHF antenna location should be placed accordingly as on Figure 2-2-4.

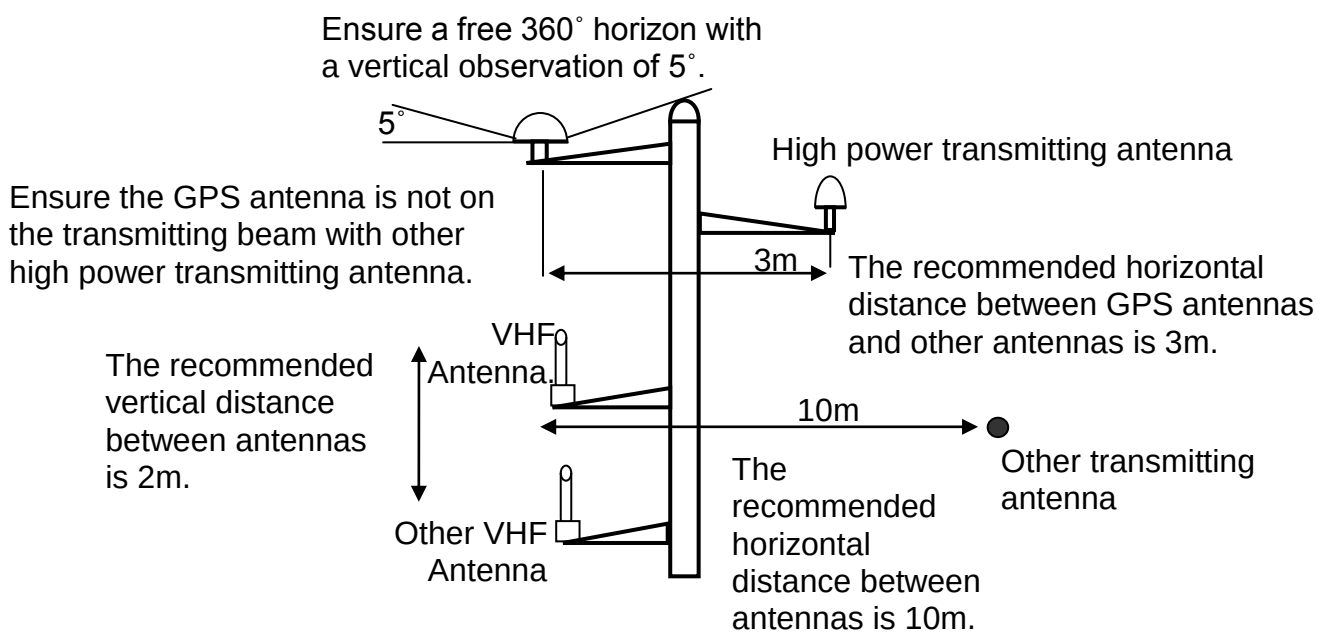


Figure 2-2-4 VHF/GPS Antenna Locations

We recommend choosing AMEC AIS VHF antenna. To save space, you can also select a VHF/GPS combo antenna provided by AMEC.

2.2.5 GPS Antenna Installation

The GPS antenna must be installed where it has a clear view of the sky, so that it may access the horizon freely with 360° degrees, with a vertical observation of 5 to 90 degrees above the horizon as illustrated in Figure 2-2-4.

GPS ANTENNA LOCATION

Enter the GPS antenna location data in “SHIP SETTING” after the installation Following is the GPS antenna location offsets.

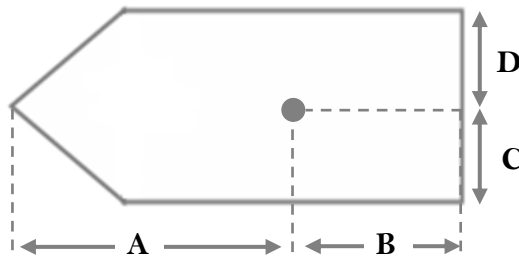


Figure 2-2-5 GPS Antenna location

We recommend choosing AMEC AIS GPS antenna. To save space, you can also select a VHF/GPS combo antenna provided by AMEC.

2.2.6 Antenna Cabling

When connecting the cable(s) with the CAMINO-101, take note of the following precautions.

- ① Do not bend the cable(s).
- ② Each coaxial cable should be set up separately and can only be set up in a single cable tube.
- ③ Each coaxial cable should keep a 10m safe distance with the power cable.
- ④ Connecting port of the coaxial cable should be insulated.

2.2.7 CAMINO-101 External Connections

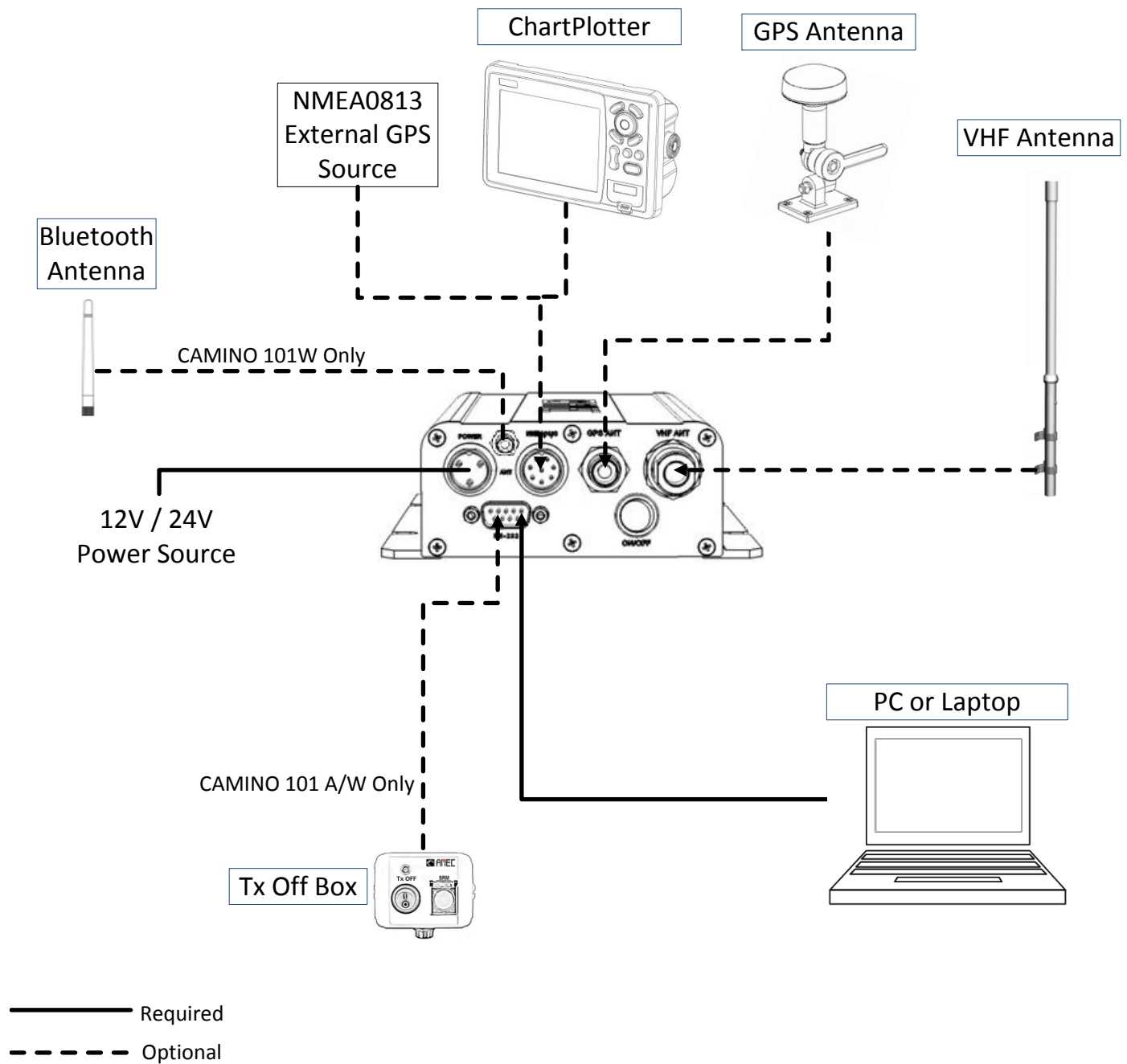


Figure 2-2-7 External configurations

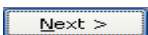
2.2.8 AMEC AIS Configuration Software Installation

This program enables users to set up own ship's dynamic, static, and voyage related information through computer.

Please find the AMEC AIS Configuration program in the CD supplied and follow the installation instructions below.

Step 1: Please open the AMEC AIS Configuration file and click on the setup icon

 AMEC AIS Configuration.exe to start the installation process.

Step 2: Please click on  to continue.

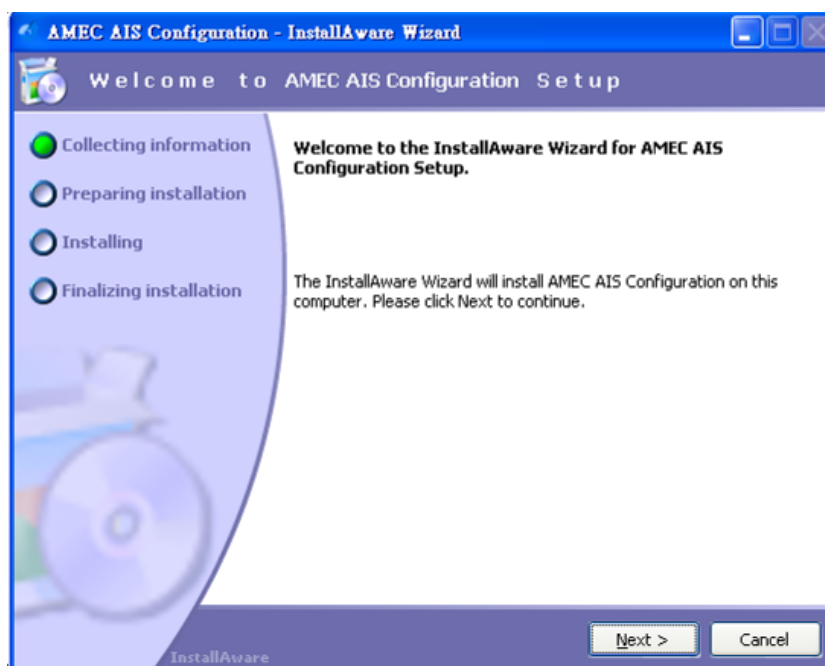
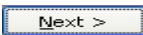


Figure 2-2-8-1 Setup Configuration

Step 3: Please read and accept the license agreement before clicking on  to continue.

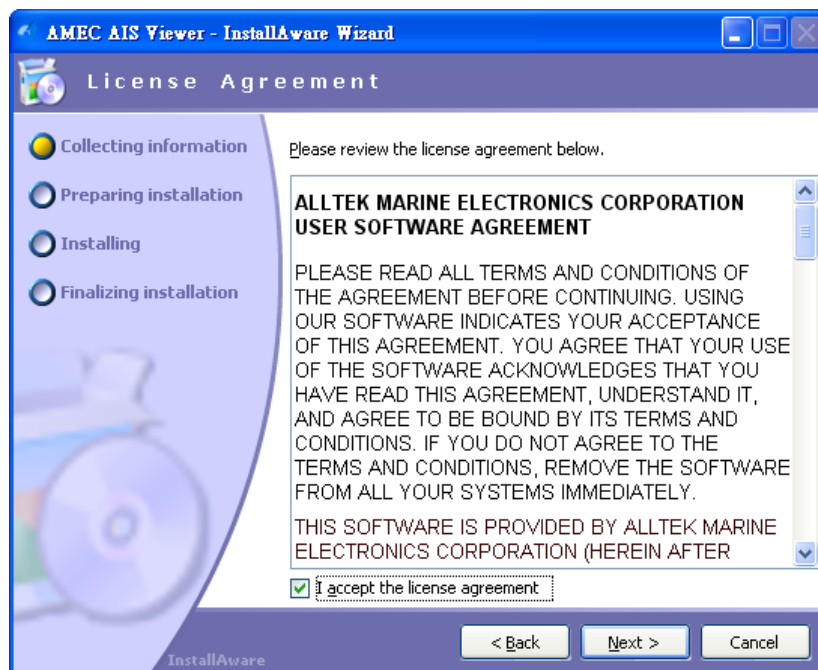
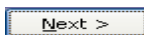


Figure 2-2-8-2 Set up Configuration

Step 4: Please fill in the required information and click on  to continue.

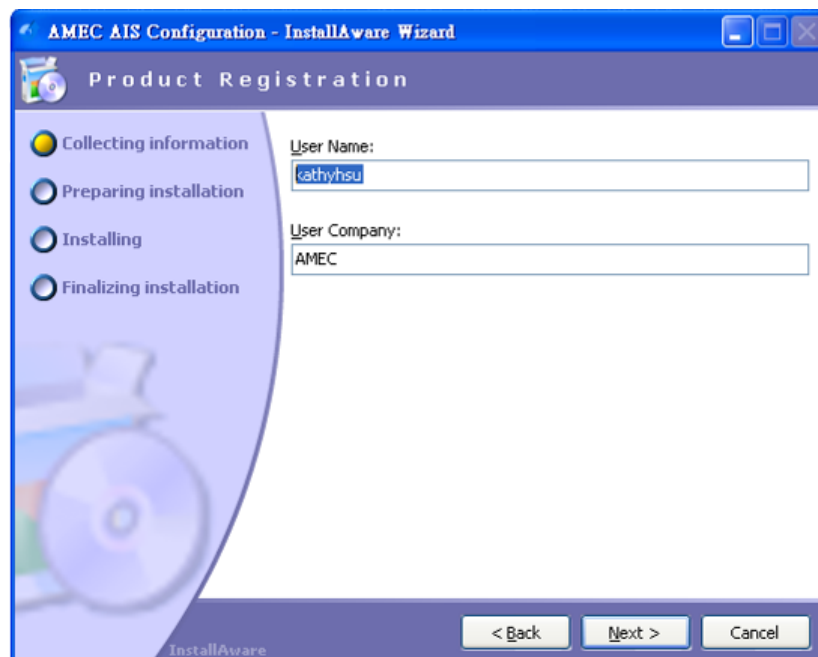


Figure 2-2-8-3 Set up Configuration

Step 5: Select the destination folder and click on **Next >** to continue.

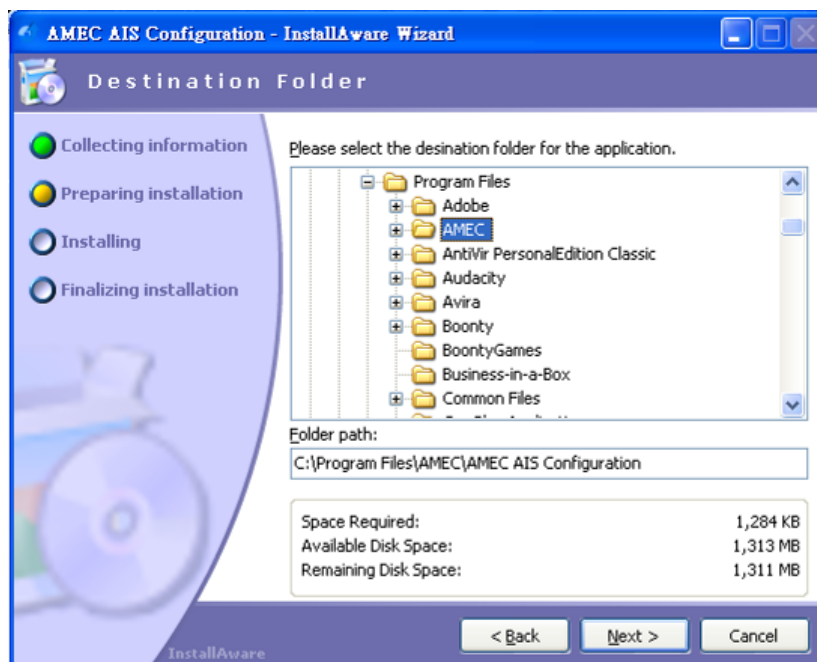


Figure 2-2-8-4 Set up Configuration

Step 6: Select the Start Menu group for the application and choose users for the program and click on **Next >** to continue.

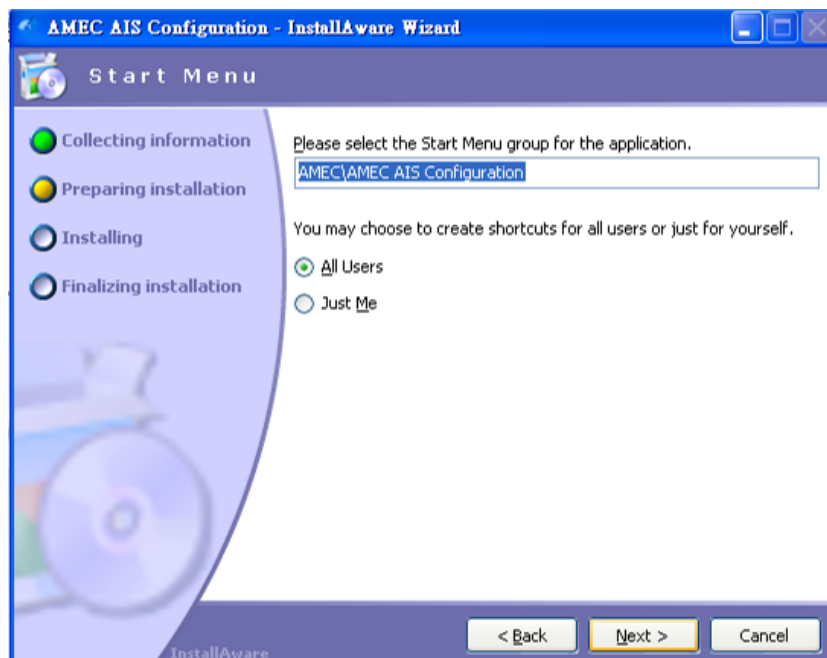


Figure 2-2-8-5 Set up Configuration

Step 7: The installation will start immediately, please wait for a short moment.

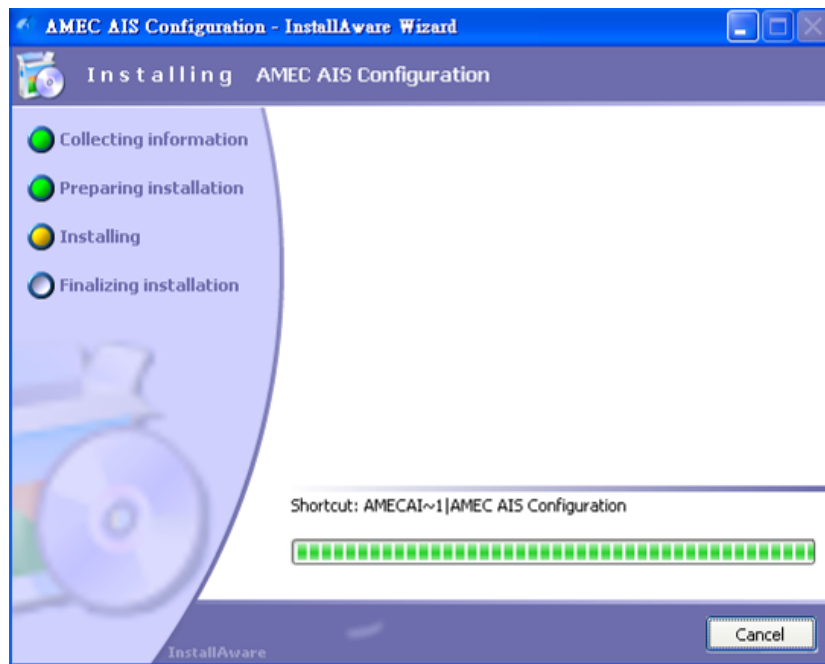


Figure 2-2-8-6 Set up Configuration

Step 8: Please click on to finish the installation. Check the checkbox to start AMEC AIS Configuration after the installation.

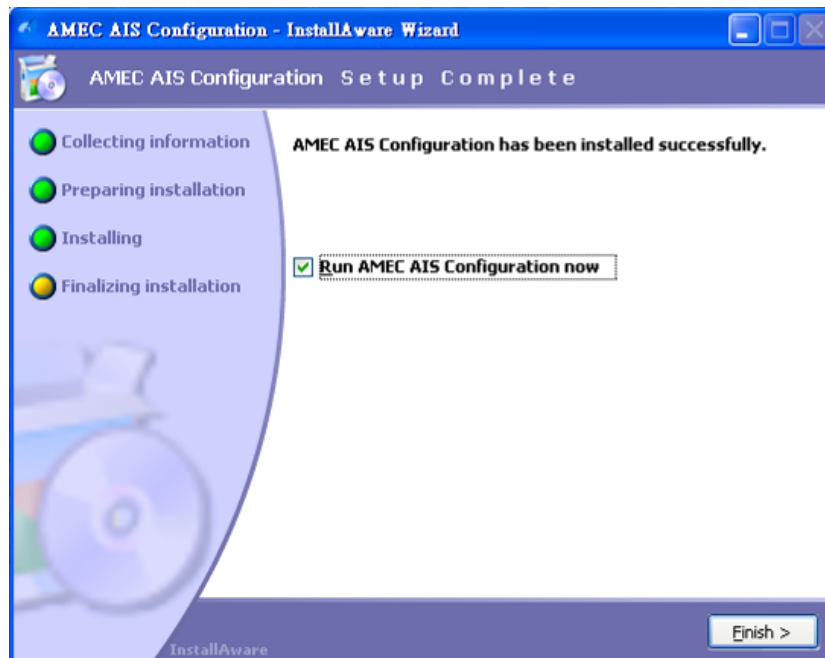


Figure 2-2-8-7 Set up Configuration

2.3 Bluetooth Pairing (Optional Feature) (CAMINO-101W only)

For CAMINO-101W with Bluetooth, please consult the manual of your Bluetooth device for pairing procedure. AMEC's default password (passkey) is "0000".

3 GET STARTED

3.1 Turning Power ON / OFF

TURNING POWER ON:

Step 1: Check the input voltage. CAMINO-101 input voltage is 12V / 24V DC.

Step 2: Connect the CAMINO-101 with power input.

Step 3: Switch the power to "ON".

Step 4: The power status indicator will turn to steady green light from flashing.

Step 5: When the power status indicator turns to steady green, the unit is in operation. The indicator of the receiving channel flashes once in a short interval whenever an AIS signal goes through.

TURNING POWER OFF:

Step 1: Switch the power to "OFF".

Step 2: The unit shuts down and the power status indicator turns off.

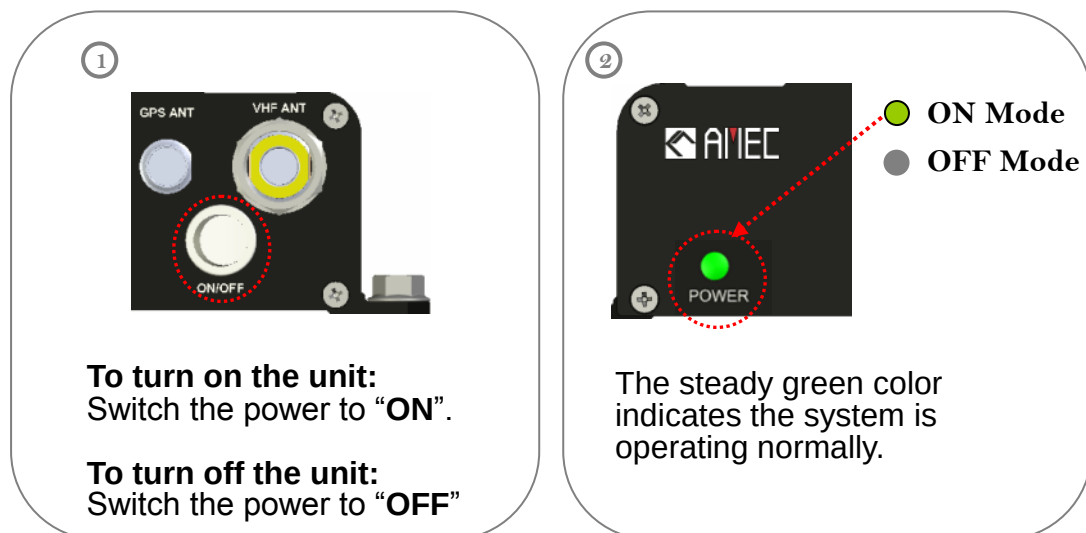


Figure 3-1 Description of Power Switch & Indication

3.2 Front Panel LED Indicators

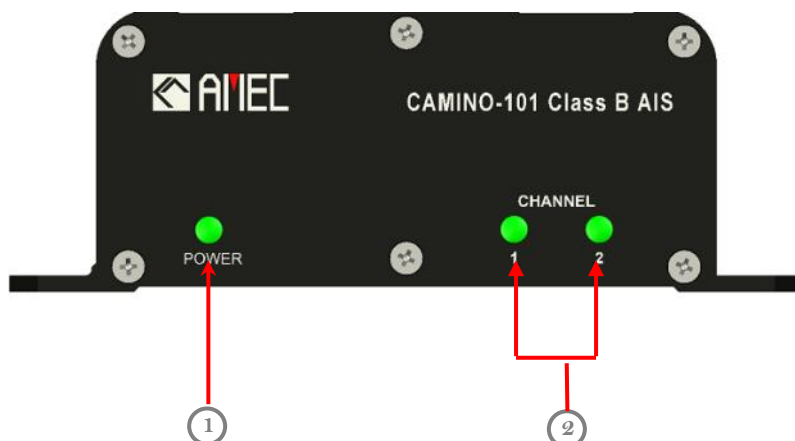


Figure 3-2 LED indicators on front panel

Table 3-2-1 Brief description of LED indicators

LED INDICATORS			
Power LED			Description
	Green	Steady	Device in normal operation
		Blinking	Initialization
	Orange	Steady	MMSI not set / silent mode (TX off)
		Flash	Transmission timeout
	Red	Steady	Power error / system failure
		Blinking	GPS not fixed over 30 minutes
Channel 1 / 2 LED			Description
	Green	Flash	Receiving AIS data
	Orange	Flash	Transmitting AIS data

Table 3-2-2 Power LED Indicator in detail

POWER LED INDICATOR			
LED Color		Indication	Description
Green	Steady	Normal	Device in normal operation
	Flash	Initialization	System initialization and checking
Orange	Steady	Silent mode	(1) MMSI is not yet programmed into the device, such that the device cannot enter into transmit mode, it can only be in “receive mode”. (2) The device is turned into Tx-Off mode (Silent mode) by setting in AMEC AIS Viewer or by using Tx-Off Switch Box. (Section 4.3.2.5)
	Flash	TX timeout	(1) Quiet time command imposed by harbor authorities (2) Transmission ceased due to carrier-sensing of high VDL load
Red	Steady	Power error	Power system is in failure
	Flash	BIIT alarm	An abnormal condition of the device is detected during BIIT (Built In Integrity Test)

Table 3-2-3 Channel LED Indicators in detail

CHANNEL LED INDICATOR		
Channel	Status	Indication
1	Flash Green	Incoming data receiving on Channel 1.
2	Flash Green	Incoming data receiving on Channel 2.
1	Flash Orange	Transmitting data on Channel 1
2	Flash Orange	Transmitting data on Channel 2

3.2.1 Built-in Integrity Test (BIIT)

With BIIT (Built in Integrity Test) function, the CAMINO-101 is constantly monitoring and testing the integrity of the AIS transceiver. Should an abnormal condition be detected within the device, the Power LED will alert with flashing red light. Abnormal conditions may include situations like the followings:

- GPS is unable to gain lock after 30 minutes of losing GPS track
- Background noise level exceeds allowable threshold (-77dBm)

3.3 CAMINO-101 Configuration Settings

To configure CAMINO-101, use the AMEC AIS Configuration software in the provided CD-ROM. The software has both configuration and diagnostic functions. Beware that MMSI setting is mandatory for CAMINO-101's operation.

3.3.1 Configuration Settings

The following steps (step 1 ~ 4) describe the details of configuration settings:

Step 1: Serial Port and Baud Rate Setting

(1) Select auto or manual for serial port number and its baud rate setting.

■ **Auto:** The system will identify and show the serial port number and baud rate automatically.

■ **Manual:** Select appropriate serial port number and baud rate manually. If the desired serial port number cannot be found under the list, manually key in the serial port number.

(2) Click on “**Connect**” to connect to the desired serial port and baud rate.

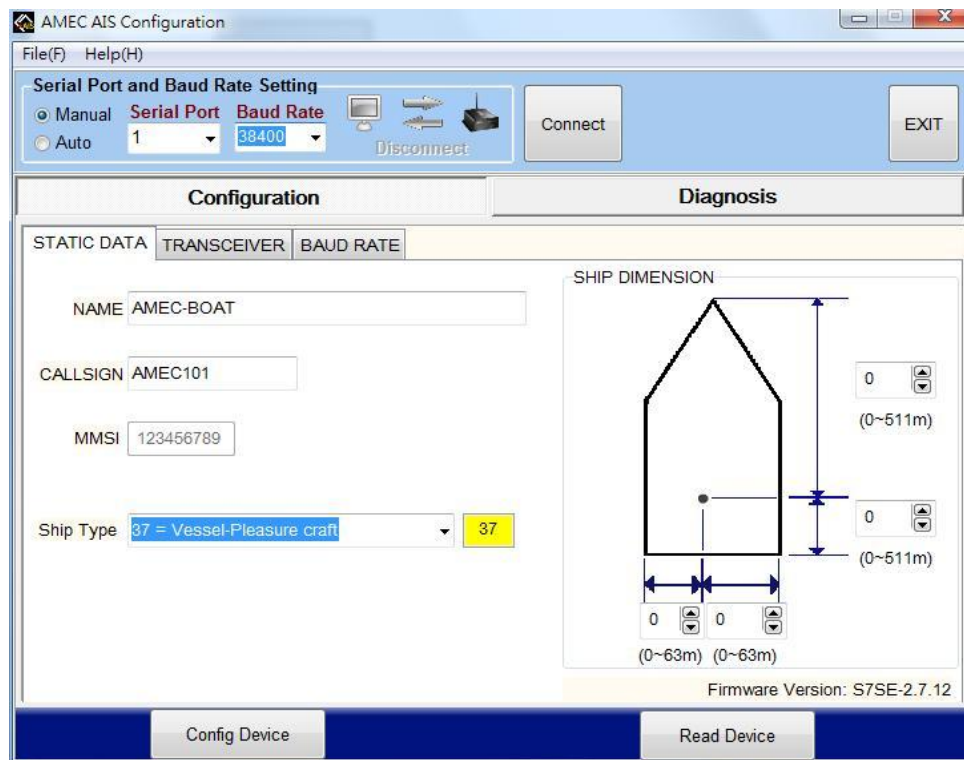


Figure 3-3-1-1 Serial Com Port and Baud Rate Setting

Step 2: Static Data Setting

(1) Click on “STATIC DATA” tab.

(2) Enter your NAME, CALL SIGN, MMSI, and select the Ship Type.

- NAME: Limited to 20 characters only.
- CALL SIGN: Limited to 7 characters only.
- MMSI: Enter your MMSI (Maritime Mobile Service Identity) number.
- Ship Type: Choose your ship type.

! WARNING: MMSI can only be entered once, please be sure entering the correct MMSI.

(3) Fill in the dimension of your own ship at "SHIP DIMENSION".



(4) Click on to confirm and complete the setting.

(5) To perform other setting, click on another tab to go further.

(6) Firmware version can be checked in the lower right corner of the window.

(7) To leave from the AMEC AIS Configuration software, click on "EXIT".

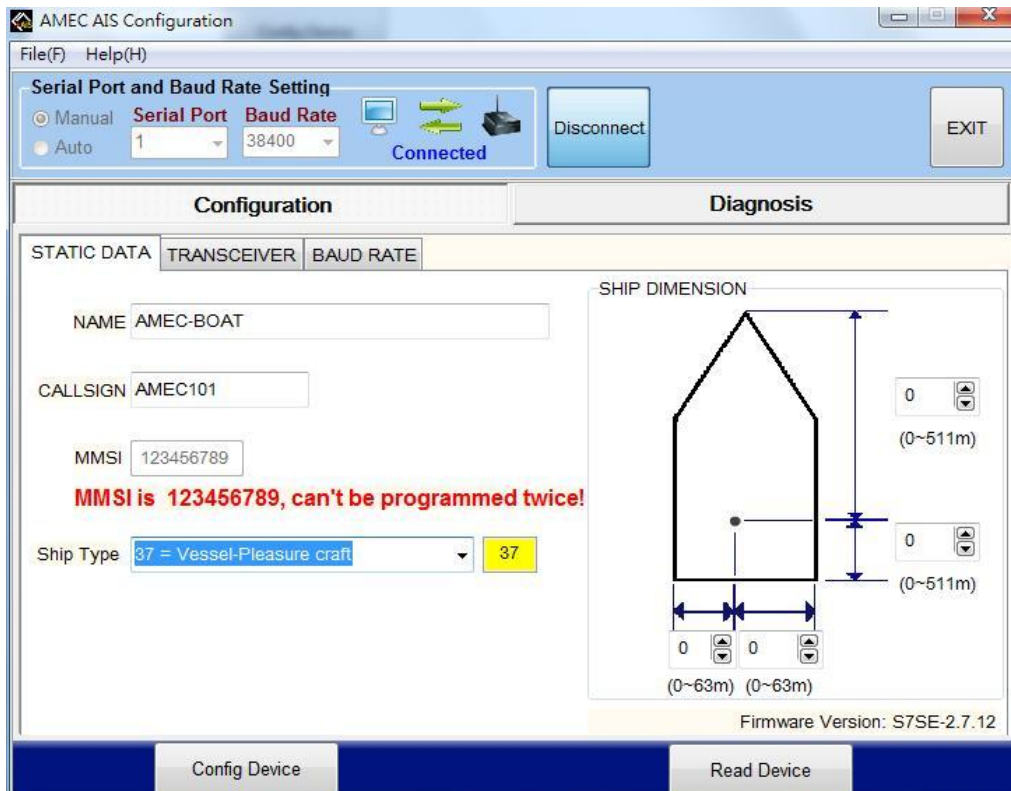


Figure 3-3-1-2 Static Data Setting

FOR USERS IN THE UNITED STATES OF AMERICA ONLY

WARNING: The entry of static data into this device shall be performed by the vendor of the device or by an appropriately qualified person in the business of installing marine communications equipment on board vessels.

FOR USERS IN THE UNITED STATES OF AMERICA ONLY

WARNING: It is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user, or to otherwise input any inaccurate data in this device.

Step 3: Transceiver Setting

- (1) To disable DSC monitoring function, select the “OFF” button. The default setting is “ON” (DSC enabled).
- (2) To disable the GPS output, check and select the “OFF” button. The default setting is “5 seconds” (GPS enabled).



- (3) Click on  to confirm and complete the setting.
- (4) To perform other settings, click on another tab to go further.
- (5) To leave the AMEC AIS Configuration software, click on “EXIT”.

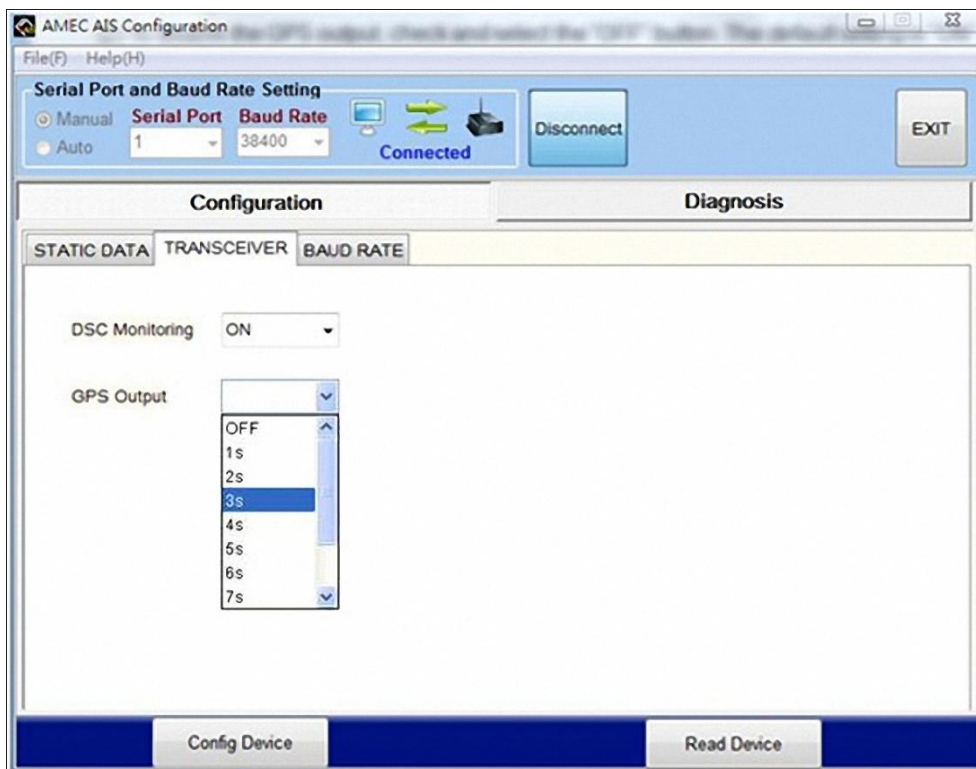
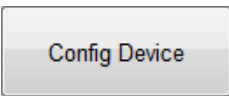


Figure 3-3-1-3 Transceiver Setting

Step 4: Baud Rate Setting

- (1) Click on “BAUD RATE” tab.
- (2) The default baud rate for RS-232 is 38,400, enter your desired baud rate if necessary*.
- (3) The default baud rate for NMEA is 38,400, enter your desired baud rate if necessary**.

- (4) Click on  to confirm and complete the setting.

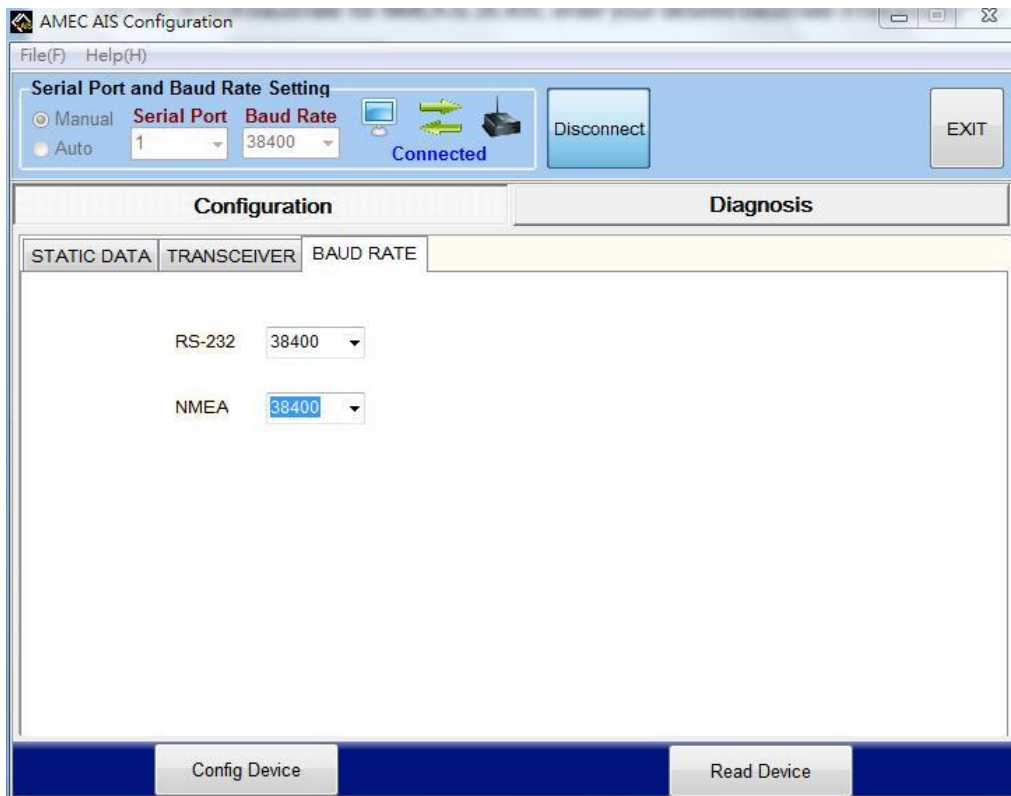


Figure 3-3-1-4 Baud Rate Setting

***NOTE:** For RS-232, CAMINO-101 supports six baud rates:

115200, 57600, 38400, 19200, 9600, 4800

****NOTE:** For NMEA 0183, CAMINO-101 supports two baud rates:

38400, 4800

(5) To perform other settings, click on another tab to go further.



(6) To read the device information, click on . A Configuration Report will pop-up in NotePad or an application that is associated for text file format.

(7) To leave from the AMEC AIS Configuration software, click on “EXIT”.

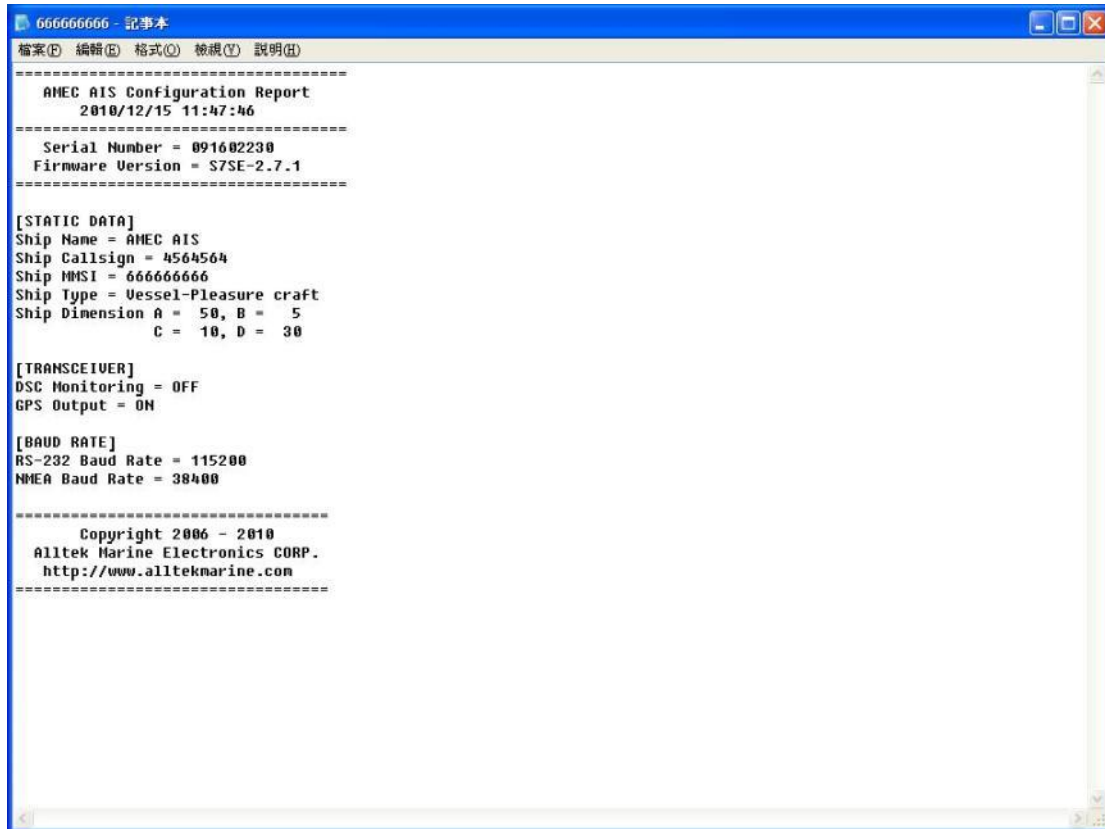


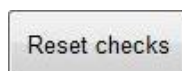
Figure 3-3-1-5 Configuration Report

3.3.2 Diagnosis Functions

The second part of the AMEC AIS Configuration software utility features diagnosis functions. This function should be performed only after the device and antennas are all fully installed. Click on the Diagnosis tab to proceed for System Check, GPS Status, and Data Log.

System Check

The SYSTEM CHECK function can be used to check the Firmware Version, Serial Number, MMSI, GPS status, AIS TX report count, and AIS RX report count of the device. This function started upon the connection of the device when powered on.



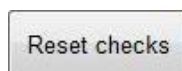
To recheck all status, click on  button.

Figure 3-3-2-1 shows the status of the device when initially connected.

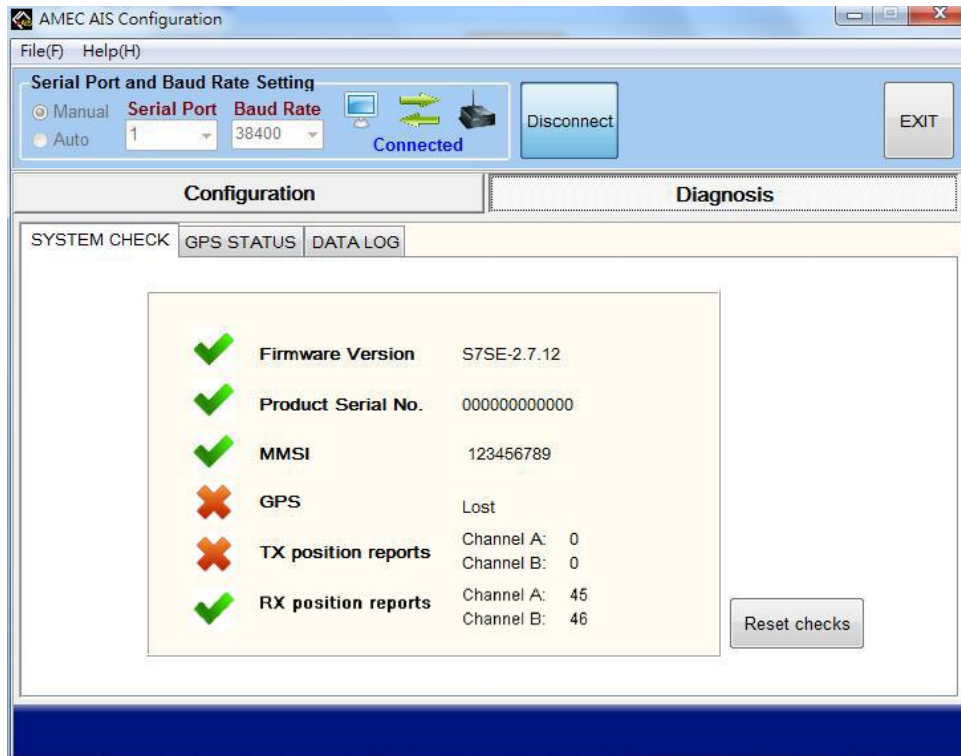


Figure 3-3-2-1 System Check

Figure 3-3-2-2 shows the status of the device after 5 to 10 minutes if all the installation is well-completed and it is transmitting / receiving normally.

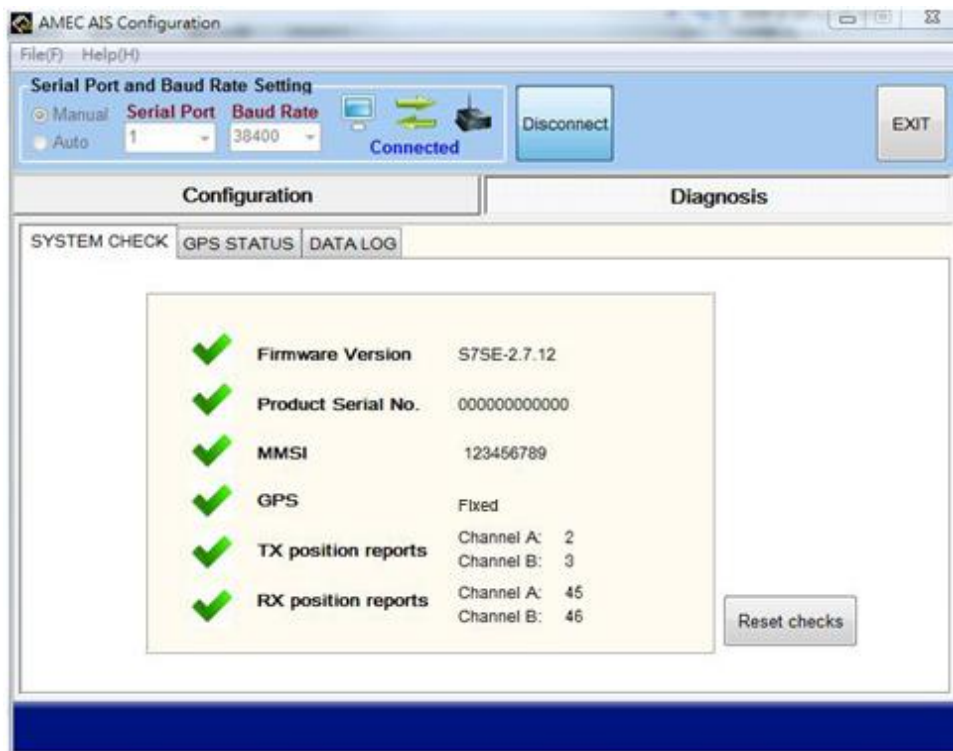


Figure 3-3-2-2 System Check

GPS Status:

This tab shows the GPS status and the connectivities of all GPS satellites being used.

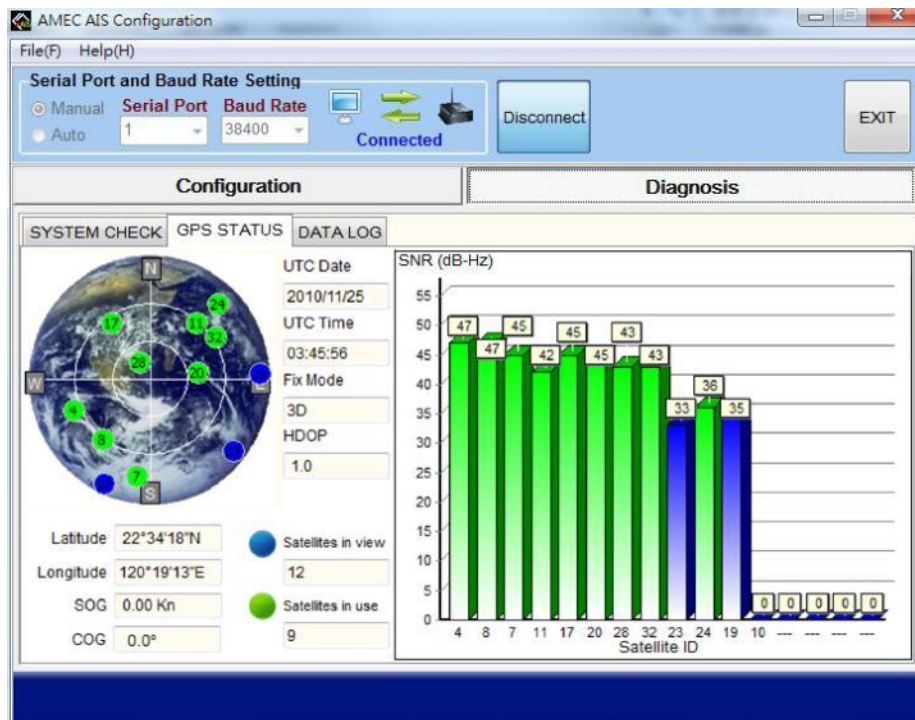


Figure 3-3-2-3 GPS Status

Data Log:

The log shows the collected AIS data log from the device. You may save or clear the current collected log.

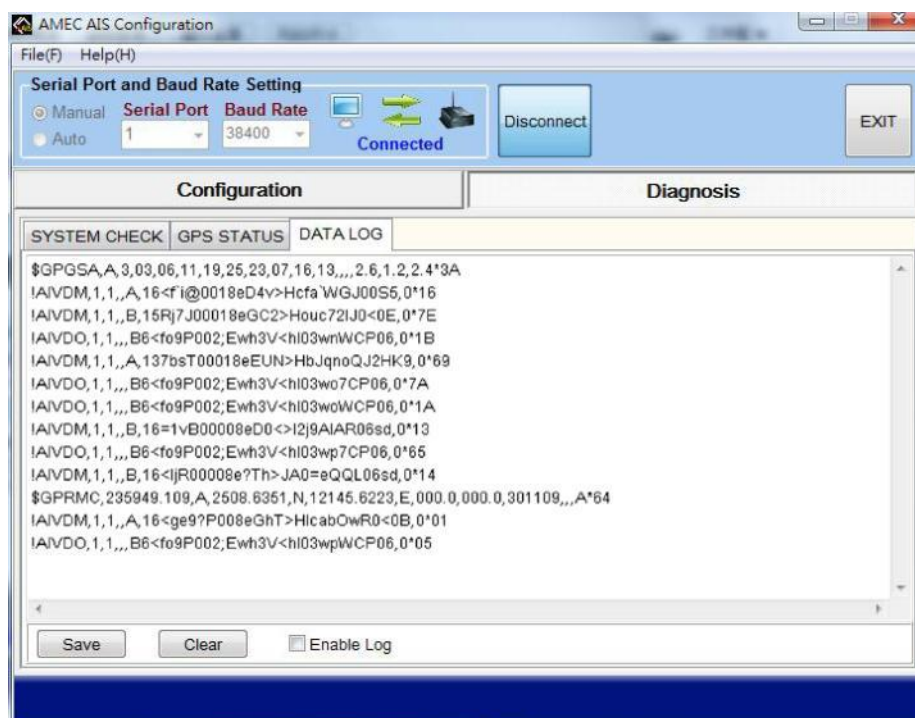


Figure 3-3-2-4 Data Log

4 AMEC AIS VIEWER DESCRIPTION

The AIS Viewer is a complimentary charting software for the purchasing of AMEC AIS Class B equipment. The software installation file and its user manual can be found in the provided CD-ROM.

RS-232 Serial Port Selection when starting AIS Viewer

To inspect if the serial port is correctly selected, please follow the steps below.

1. Use RS-232 port to connect with PC and AMEC AIS transponder when desired*.

***NOTE:** CAMINO-101 can also be connected to the USB ports of PC/Laptop through RS-232/USB converter (not included in the accessory kit; purchase separately). Please install the USB driver before connecting to the USB ports.

■ Windows 7 or VISTA version:

Click on “Start” → Select “Control Panel” → Select “Device Manager” → Click Port (COM&LPT)

■ Windows XP version:

Click on “Start” → Select “My Computer” → Click “Control Panel” → Select “System” → Choose “Hardware” → Select “Device Manager” → Click Port (COM&LPT)

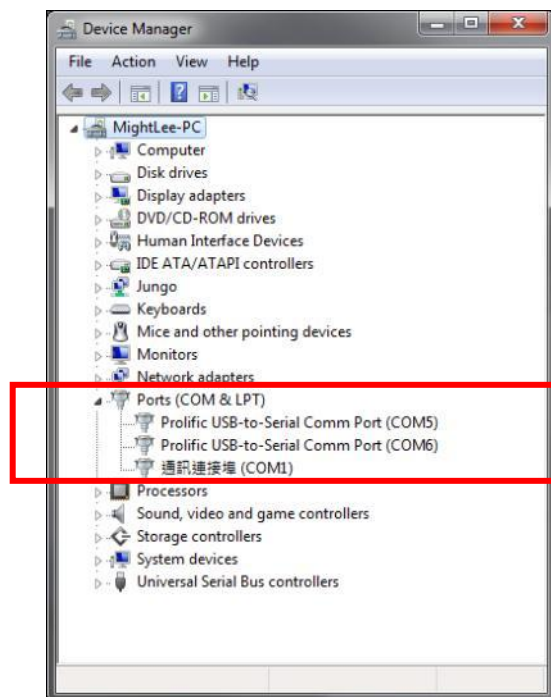


Figure 4-1 Serial Port setting

5 APPENDIX

5.1 Product Specifications

AMEC CAMINO-101 SPECIFICATIONS

APPLICABLE STANDARDS

IEC 62287-1 Ed. 2, 2010	IEC 61108-1 Ed. 1, 2003
IEC 61162-1 Ed. 3, 2007	IEC 60945 Ed. 4, 2002
IEC 61162-2 Ed. 1, 1998	ITU-R M.1371-4, 2010

VHF TRANSCEIVER

Frequency Range	156.025 MHz~162.025 MHz
Channel Bandwidth	25 KHz
Modulation	GMSK / FM
Data Rate	9.600 bps
Number of AIS Transmitter	1
Number of AIS Receiver	2 (one time-shared between AIS and DSC)
Number of DSC Receiver	1 (time-shared between AIS and DSC)
AIS Channel 1	CH 87B (161.975 MHz)
AIS Channel 2	CH 88B (162.025 MHz)
DSC Rx Channel	CH 70 (156.525 MHz)
Tx Power Output	2 Watt (33 dBm $\pm$ 1.5 dB)
Transmission Spectrum	IEC 62287-1 compliant
Rx Sensitivity	< -107 dBm @ 20% PER
Rx Message Format	AIS Class A & B message

DSC RECEIVER

Modulation	1,300 Hz / 2,100 Hz FSK
Data Rate	1,200 bps $\pm$ 30 ppm
Spurious Response Rejection	$\geq$ 70 dB for signal @ -104 dBm; BER $\leq$ 1%
Blocking	$\geq$ 84 dB for signal @ -104 dBm; BER $\leq$ 1%

GPS RECEIVER (integrated)

Receiving Channels	48 channels
Accuracy	IEC 61108-1 compliant
Output Rate	1 Hz

POWER SUPPLY

Supply Voltage	12V / 24V DC
Power Consumption	Less than 4W average @ 12VDC

LED INDICATION

Power LED	(dual color)	System OK, Silent mode, Tx timeout, Error, BIIT alarm
Channel 1 LED	(dual color)	Transmitting / receiving AIS data
Channel 1 LED	(dual color)	Transmitting / receiving AIS data

CONNECTION INTERFACE

GPS Antenna Connector	TNC (Female)
VHF Antenna Connector	PL-259 (Female)
NMEA0183 (RS 422)	IEC 61162-1 / IEC 61162-2, Baud rate 38,400 (default), programmable, Input/output at same baud rate
RS-232	Baud rate 38,400 (default), programmable
Silent Mode Switch Input	Via Tx-Off Switch Box (Optional)
Alarm Output	Relay contact
Wireless Connection	Bluetooth (Optional)

ENVIRONMENTAL

Operating Conditions	IEC 60945 “protected” category
Operating Temperature	-15°C~55°C
Storage Temperature	-25°C~70°C
Operating Humidity	95% RH at 40°C
Vibration, EMI, ESD	IEC 60945 compliant
Waterproof	IPX5
Compass Safe Distance- Standard Magnetic	0.45 m
Compass Safe Distance- Steering Magnetic	0.30 m

PHYSICAL

Width	140 mm (5.51 inch)
Height	50 mm (1.91 inch)
Depth (include connectors)	200 mm (8.66 inch)
Weight	870 g

SOFTWARE TOOL

AMEC AIS Configuration	Configuration utility on PC, standard supply in CD
AMEC AIS Viewer	AIS Viewer on PC, standard supply in CD

AMEC AGGRESSOR-21 GPS Antenna SPECIFICATIONS (Optional)



GENERAL

Center Frequency	1575.42 ± 2 MHz
Gain	30 dB, typical (excluding cable)
Noise Figure	1.5 dB, typical
Bandwidth	2 MHz min.
Axial Ratio @ Zenith	3 dB max.
VSWR	1.2 typical (1.5 max)
Output Impedance	50 ohm

ENVIRONMENTAL

Operating Temperature	−25°C to +55°C
Relative Humidity	40% to 95% non-condensing
Storage Temperature	−25°C to +70°C
Water Resistance	In accordance with IEC 60945, exposed
Operating Temperature	−25°C to +55°C

PHYSICAL

Dimensions	90.5 mm (diameter) × 108.5 mm (H)
Ground Size	74 mm (diameter)
Weight	150 grams (without cable)
Connector	TNC (female)
Cable	10 m, RG-58 cable included

5.2 Dimensions

Front View

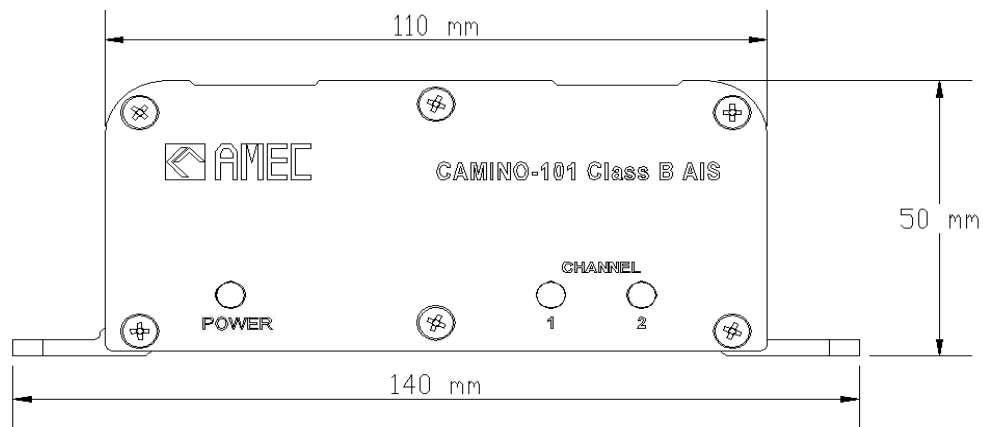


Figure 5-2-1 CAMINO-101 Front View

Top View

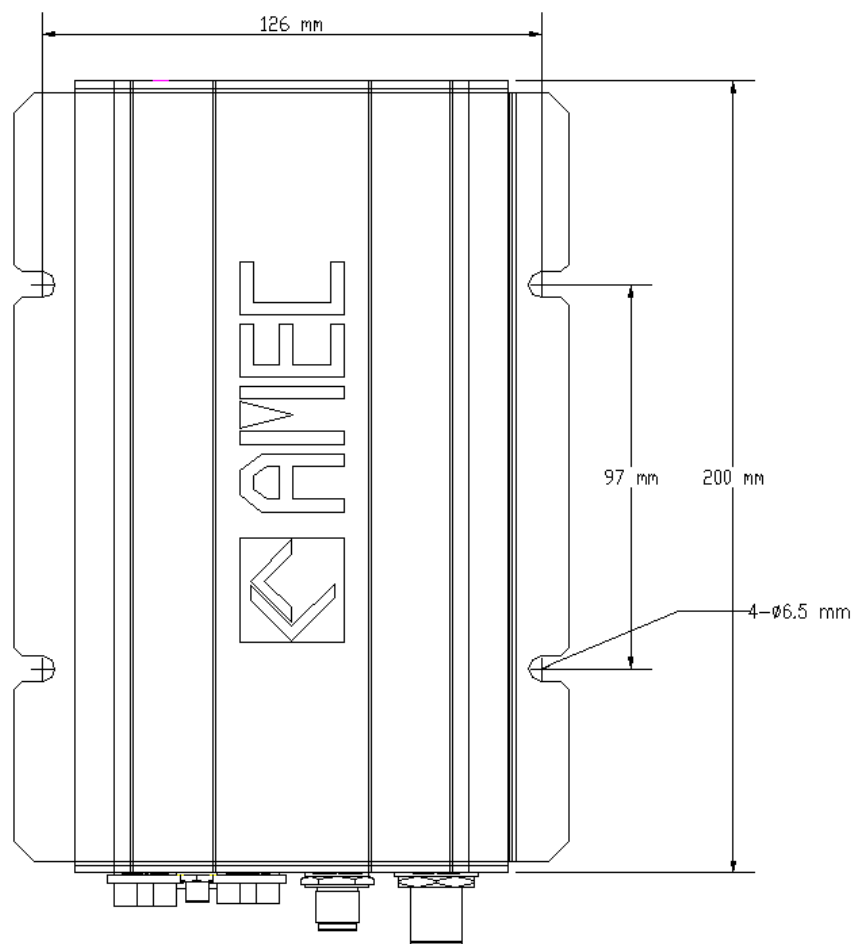


Figure 5-2-2 CAMINO-101 Top View

Side View

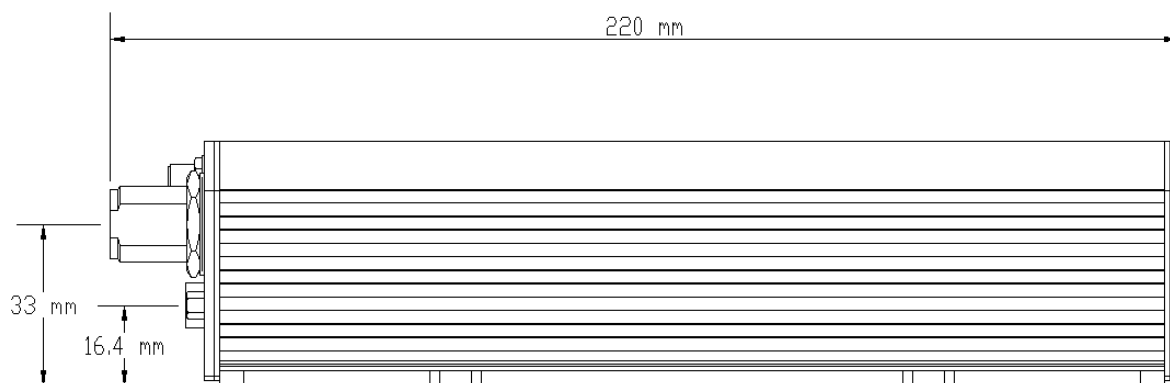


Figure 5-2-3 CAMINO-101 Side View

5.3 Ordering Information

Table 5-4 Accessories

Item	Model Name	Description
1	CAMINO-101	Standard AIS Class B transponder, silent mode configurable via AMEC AIS Configuration software tool;
2	CAMINO-101A	Standard AIS Class B transponder, silent mode configurable via AMEC AIS Configuration software tool, silent mode switchable via optional Tx-Off Switch Box;
3	CAMINO-101W	Standard AIS Class B transponder with Bluetooth function, silent mode configurable via AMEC AIS Configuration software tool, silent mode switchable via optional Tx-Off Switch Box;

5.4 Accessories

The following accessories are available from AMEC. Contact our local dealer/agent for more details.

Table 5-4 Accessories

Item	Description	Product Code	Remark
1	VHF Antenna	TENTA-11	Length: 1,200 mm
2	GPS Antenna	AGGRESSOR-21	Dimension: 90.5 mm(Diameter) x 108.5 mm(H)
3	VHF/GPS Combo Antenna	TENTA-12	Length: 1,680 mm

5.5 Trouble Shooting

5.5.1 Diagnosis by LED Indicators

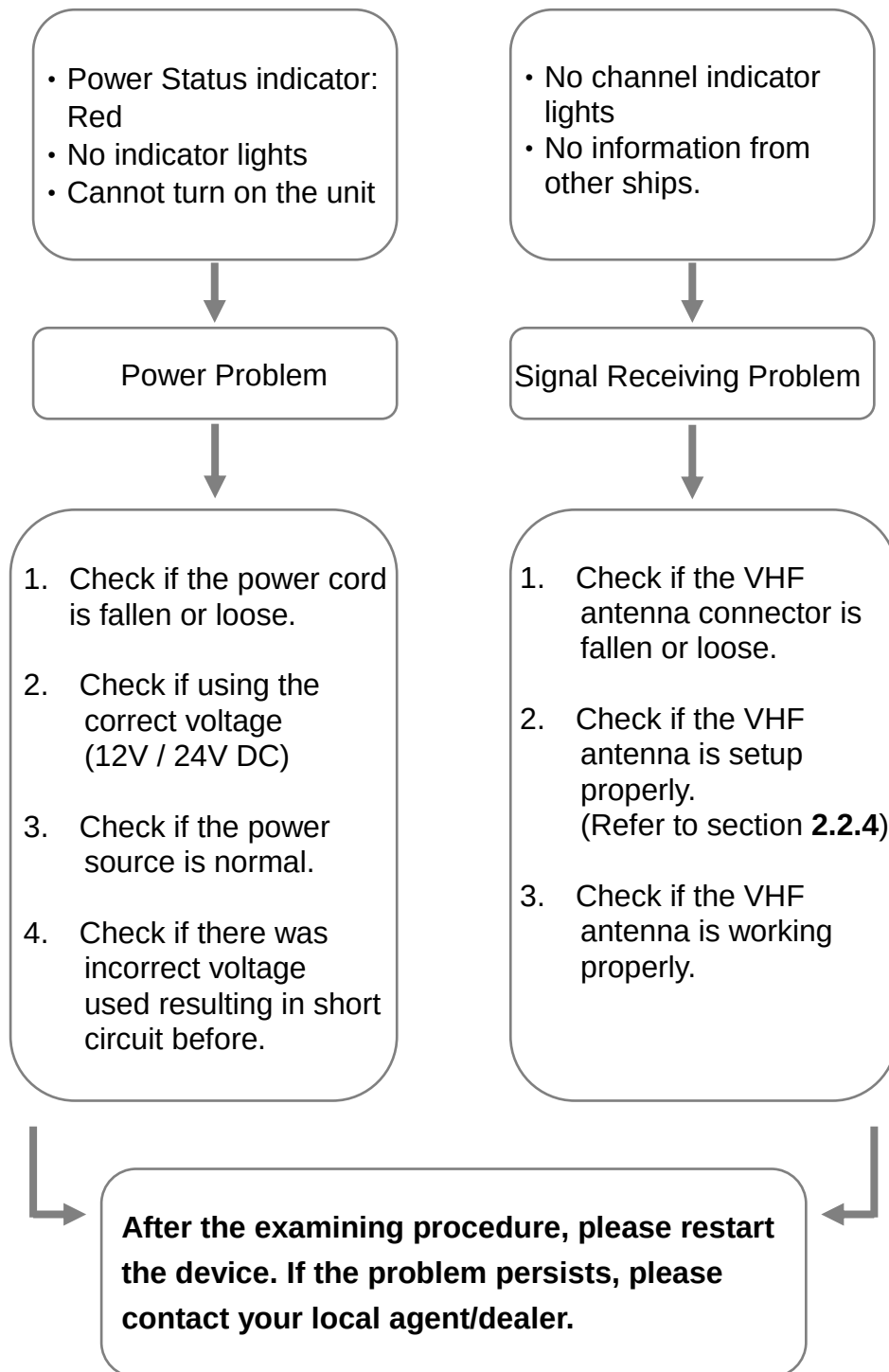
- The power indicator changes to different color indicating its current status. User is able to make a general analysis based on the status described below,

Table 5-5-1 Power LED indicator

POWER LED INDICATOR			
Color	Status	Indications	Descriptions
Orange	Steady	Silent mode	(1) No MMSI data is input (2) Tx Off Mode
Orange	Flash	TX timeout	Quiet mode commanded by harbor authorities or due to High VDL load
Red	Steady	Power Error	Power system is in failure
	Flash	BITT alarm	An abnormal condition of the device is detected during BIIT (Built In Integrity Test)

- If the problem persists (Power LED indicator still in red), please follow the steps below to restart the unit.
 - 1. Disconnect the power cord off the unit, reconnect after 1~2 minutes.**
 - 2. Please Refer to section 3.1 to turn on the unit.**
- If the problem still persists, contact your local agent/dealer.

5.5.2 Problem Analysis



- Power Status Indicator: Orange
- Signal data cannot be received by other vessels

Signal Transmitting Problem

1. Check if the power status indicator HAVING STEADY ORANGE LIGHT.
 - No MMSI data input
Please check the MMSI input data.
2. Check if the power status indicator FLASHES ORANGE.
 - Transmission is suspended by the harbor authorities or due to high VDL load.
3. Check if the channel indicator FLASHES ORANGE.
 - VHF antenna works improperly
Check if the VHF antenna connector is fallen or loose, and see if it sets up properly.
 - Class B signal cannot be interpreted by a less updated Class A device
Software upgrade for Class A device may be needed.

After the examining procedure, please restart the device. If the problem persists, please contact your local agent/dealer.



6 AMEC WORLD WIDE WARRANTY

Limited warranty

Subject to the terms, conditions and limitations set forth in this Worldwide Limited Warranty (hereinafter the “Warranty”), AMEC warrants that its products, when properly installed and used, will be free from defects in material and workmanship for a period of twelve (12) months, from the date of first purchase (the ‘Warranty Period’)

For the purposes of this warranty, ‘date of first purchase’ means the date that the product was purchased by the first retail customer, or by the institutional customer, or in the case of a product installed on a new vessel or any other marine related platform by a certified AMEC original equipment manufacturer (a ‘AMEC OEM’), the date that such vessel was purchased by the first retail customer.

AMEC will, at its sole option, repair or replace any defective products or components returned during the Warranty Period in accordance with the terms, conditions and limitations set forth below. **Such repairs or replacement will be the sole remedy of the customer under this Warranty.**

Standard Warranty Service

To qualify for standard warranty service the product must be returned to a AMEC-certified service agent (i) within the Warranty Period, and (ii) within thirty (30) days of the alleged product failure. Any products returned must be securely packaged and sent pre-paid and insured to AMEC or to a AMEC-certified service agent. All products returned must be accompanied by a copy of the original sales receipt to be eligible for standard warranty service.

Obtaining Warranty Service

A list of AMEC-certified service agents is available from AMEC Technical Support at www.alltekmarine.com

Other conditions

This Warranty is fully transferable provided that you furnish the original proof of purchase to the AMEC -certified service agent. This Warranty is void if the label bearing the serial number has been removed or defaced.

Limitation and Exclusions

In addition to any other limitations and exclusions set forth herein, AMEC is not responsible for, and this Warranty does not cover:

Failure due to abuse, misuse, accident, unauthorized alteration, modification or repair, improper installation or operation (whether or not by a AMEC-certified service agent) or improper storage, shipping damage or corrosion;



Costs associated with routine system checkouts, alignment/calibration, sea trials or commissioning;

Defects or damage that result from the use of non-AMEC branded or certified products, accessories or other peripheral equipment, including without limitation housings, parts, or software;

Aftermarket software (i.e. all software other than the original operating software sold with the products);

Products that have been refurbished, reconditioned, or remanufactured (The foregoing does not apply to products repaired or replaced pursuant to the terms of this Warranty).

Products that have been dismantled resulting in the broken label on the Products;

costs associated with overtime or premium labor costs;

differences in material, coloring or size that may exist between actual products and the pictures or descriptions of such products in our advertising, advertising literature or on the Internet;

TO THE EXTENT PERMITTED BY APPLICABLE LAW, THE FOREGOING WARRANTY IS AMEC'S SOLE WARRANTY AND IS APPLICABLE ONLY TO NEW PRODUCTS PURCHASED WORLDWIDE. THE PROVISIONS OF THIS WARRANTY ARE IN LIEU OF ANY OTHER WRITTEN WARRANTY, WHETHER EXPRESSED OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

THE LIABILITY OF AMEC TO A CUSTOMER UNDER THIS WARRANTY, WHETHER FOR BREACH OF CONTRACT, TORT, BREACH OF STATUTORY DUTY OR OTHERWISE SHALL IN NO EVENT EXCEED AN AMOUNT EQUAL TO THE TOTAL PURCHASE PRICE OF THE PRODUCT GIVING RISE TO SUCH LIABILITY AND IN NO EVENT SHALL AMEC BE LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES OR LOSS OF GOODWILL, REPUTATION, LOSS OF OPPORTUNITY OR INFORMATION, DATA, SOFTWARE OR APPLICATIONS.

SOME JURISDICTIONS DO NOT ALLOW EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY FROM JURISDICTION TO JURISDICTION.

This Warranty supersedes and replaces all previous Warranties.

In the event that any term or provision contained in this Warranty is found to be invalid, illegal or unenforceable by a court of competent jurisdiction, then such provision shall be deemed modified to the extent necessary to make such provision enforceable by such court, taking into account the intent of the parties.



No oral or written representations made by AMEC or any seller, reseller or distributor of the products, including employees and agents thereof, shall create any additional warranty obligations, increase the scope, or otherwise modify in any manner the terms of this Warranty.

All AMEC products sold or provided hereunder are merely aids to navigation. It is the responsibility of the user to exercise discretion and proper navigational skill independent of any AMEC product.

7 FEDERAL COMMUNICATION COMMISSION INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures :

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

8 DECLARATION OF CONFORMITY

Hereby, Alltek Marine Electronics Corp. (AMEC) declares that this CAMINO-101 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

9 INDUSTRY CANADA NOTICE TO USERS

AMEC cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation of the device.

10 ABBREVIATIONS

AIS	Automatic Identification System
COG	Course Over Ground
CPA	Distance to Closest Point of Approach
CSTDMA	Carrier-Sense Time Division Multiple Access
DSC	Digital Selective Calling
ECS	Electronic Chart System
ETA	Estimated Time of Arrival
GPS	Global Positioning System
IMO	International Maritime Organization
MMSI	Maritime Mobile Service Identity
SOG	Speed Over Ground
SRM	Safety Related Message
TCPA	Time to Closest Point of Approach
TDMA	Time Division Multiple Access
UTC	Coordinated Universal Time
VHF	Very High Frequency
VTS	Vessel Traffic Services